The UK's best-selling Apple mag!

NEW LOOK!

Mac FORMAT

Issue 296 > February 2016
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Get more from OS X

El Capitan

> Go even deeper into OS X and unlock your Mac's true potential

PLUS! Definitive 4K iMac review

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The ultimate guide to making your Mac better than ever!

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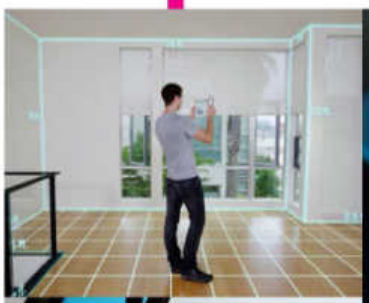
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GOPRO APP + GOPRO STUDIO

#BEAHERO

Mac FORMAT PRESENTS

iOpener

Game-changing tech from the world of Apple and beyond









The device clips onto the camera side of the iPad with a bracket. The Lightning cable comes off the other side.

Structure Sensor

Turn an iPad's camera into a mobile 3D scanner

2D is so yesterday! This accessory attaches to an iPad and connects with a Lightning cable. The sensor expands on the iPad's built-in camera to capture and display 3D scans. It casts thousands of invisible infrared dots onto objects in a room. Using 'structured light', the sensor records the distance between each dot and the camera to construct a 3D geometric picture. The sensor has a depth sensing range of nearly 12 feet, so it's perfect for scanning around indoor rooms to take multiple measurements at once.

› **FROM** $379 (about £250) › **WEBSITE** structure.io

› **INCLUDES** iPad bracket › **WORKS WITH** iPad Air, iPad Air 2, iPad mini 2, 3 and 4



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TUDOR

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3 ISSUES FOR £5!*
Turn to page 46
*INCLUDES PRINT AND DIGITAL EDITIONS



It's exactly 32 years since the Mac first said "hello", and to celebrate we're saying hello with an **all-new MacFormat**. We've been hard at work reinventing the magazine to better reflect your needs and today's changes in the Apple ecosystem. As well as a **fresh new design**, which we hope you'll find easier to read, we've introduced some brand-new sections and totally overhauled others too.

First off there's **Apple Home, your new monthly guide to the connected home**, something that's becoming increasingly important to the world of Apple with the advent of HomeKit. Each issue we **go deep into smart home tech** to help you make the right purchases and show you how to make it all work with your Apple devices.

Next up is **Genius Tips**, a new troubleshooting section that's easier to navigate, and which is more focussed on the most common queries to our helpdesk. We also know how much you like to hang onto your classic Macs, that's why **our new Love Your Mac section brings you inspiring ideas** on what to do with those bits of Apple kit in your loft!

Our tutorial and review pages have been given a fresh feel, and in our new **Store Guide** you'll find the most up-to-date buying advice for the core Apple product range and our recommended buys for complementary accessories.

The new mag was directly influenced by your feedback. We hope you enjoy it and don't hesitate to get in touch.



CHRISTIAN HALL
EDITOR
editor@macformat.com

Meet the team



Alan Stonebridge
Production Editor
Such is Alan's love of *Star Wars*, he will have seen *The Force Awakens* three times by now – he preordered it on iTunes weeks ago!



Alex Blake
Commissioning Editor
Alex has resolved to buy a new iMac, MacBook, iPhone and iPad, just as soon as he's inherited vast riches from a mysterious benefactor.



Paul Blachford
Managing Art Editor
Paul was last seen under an enormous pile of redesign printouts. If seen, please call his family so he can get home for a late Christmas.



Seth Singh
Digital Art Editor
Seth is totally pumped to finally get his hands on the technologically advanced Apple TV so he can, er... watch TV.

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WIN! AN AMAZING **iPHONE 6s** BUNDLE

Smartphone plus battery packs!



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APPLE CORE

EDITED BY **CHRISTIAN HALL**



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APPLE RUMOUR

The 15-inch MacBook Air

Against the odds, the MacBook Air may get a new lease of life

We thought 2015's ultrathin and light 12-inch MacBook would replace the MacBook Air, but if the rumours are true we could see a new range of Airs in mid-2016. With the 12-inch MacBook fulfilling needs when it comes to small screens, it's more likely that an updated MacBook Air range would come in 13-inch and 15-inch screen sizes. Let's look at the likely benefits of that.

Alex says...



Despite the MacBook, there is still a place for a new range of Airs

1 TERRACED BATTERY TECHNOLOGY

A new Air is sure to use the clever, tiered battery tech that debuted in the MacBook, ensuring a slim profile yet decent all-day battery life.



2

BUTTERFLY KEYBOARD

› A thin profile demands that the MacBook's butterfly keyboard would be used here, perhaps with stereo speakers either side of it.

3

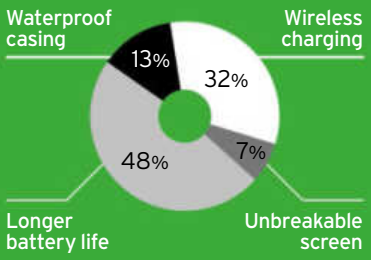
ONE PORT TO RULE THEM ALL

› A thinner Air would use USB-C as its sole connection. Thunderbolt 3 uses the same connector – this could be one of the first Macs with it.

Mac FORMAT

THE POLL

WE ASKED... What would be your most desired feature for the iPhone 7?



› Log on and see next issue's big question!
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RUMOUR MILL

› Hot on the heels of the tech giant's latest moves...

1

UP IN THE AIR

› Fingers point to a March release for iPad Air 3, with a beefed-up processor, but there won't be any 3D Touch tech like that on the iPhone.

2

SLOW STREAM

› Reports suggest Apple's streaming service (dubbed 'Apple Video') could be significantly delayed. It may take Apple years to put the network deals in place.

3

TO 'C' OR NOT TO 'C'?

› Apple maybe ready to add to the iPhone line-up with a 'budget' release of an iPhone 6c, sporting an A9 processor and a plastic body.



CLASSIC APPLE FACTS

$666.66

THE PRICE THAT THE APPLE I FIRST SOLD FOR

› Steve Wozniak said that it was simply because he "liked repeating digits", and when the price worked out at $667 (a markup of a third) he changed it to $666.66 because it was simply an easier number to write.

10%

THE STAKE THAT RONALD WAYNE HAD IN APPLE

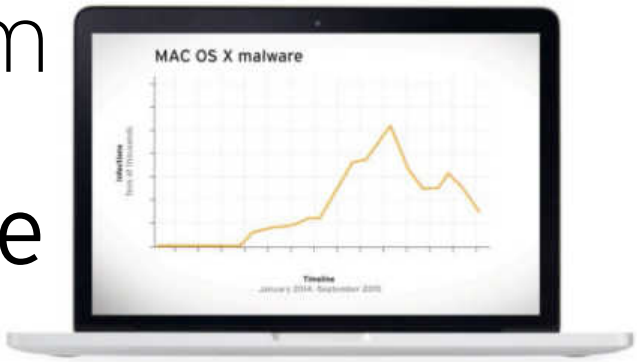
› Wayne was the third Apple co-founder and held a tenth of the company on 1 April, 1976. He sold up for just $800 on 12 April, 1976. He also accepted $1,500 to not claim against Apple in the future. In 1982, Apple made its first billion dollars and is now worth more than $700 billion.

481

THE NUMBER OF APPLE STORES IN THE WORLD

› Apple's stores have expanded steadily since 2005, and they now exist in 18 countries. Its online store operates in 39 countries so far.

The Phantom Menace: Mac malware on the rise?



A new report highlights a spike in Mac security threats

Mac users have always felt rather well- insulated from the malware that has so blighted PC users, but a report from security sages Symantec suggests that may soon change.

The firm points to a number of recent Apple security breaches – such as the XcodeGhost debacle of September 2015 – as evidence that Mac and iOS threats are on the rise. It quoted a recent study that found that the number of OS X malware samples detected in 2015 was five times greater than the previous five years combined.

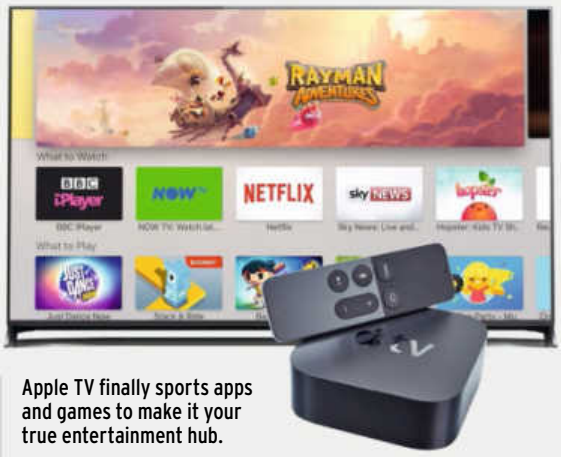
"Should Apple continue to grow in popularity, it seems likely that these trends will continue", said report author Dick O'Brien. Elsewhere, the report suggests that the growing popularity of Apple products may spur on the malware authors.

However, O'Brien also pointed out that "the number of threats targeting Apple operating systems remains quite low" when compared to competitors, with only 15 malware threats being uncovered in 2014.

Part of this is no doubt due to Apple's close control over its ecosystem, as well as the combination of the company's 'walled garden' approach to iOS app distribution, tight OS X security features such as Gatekeeper, and the lower overall market share of Macs.

Apple TV entertainment apps are a hit

Recreational apps prove to be the most popular downloads



Apple TV finally sports apps and games to make it your true entertainment hub.

Two months after the launch of the new Apple TV, the platform is faring well according to data analysts AppFigures, with roughly 3,000 apps being available for it by the end of 2015.

The data suggests that tvOS has been warmly embraced by developers, with the number of apps growing at a similar pace to the iOS App Store when it first launched.

Predictably, there were more tvOS games available for download than any other category of app, with almost two fifths of apps falling into this category. However, the majority of the 50 most downloaded apps were actually from the entertainment category, suggesting they are more popular among users – with the top 10 apps all being streaming services such as Netflix. The BBC released its iPlayer app in December.

As for pricing, most apps made for the tvOS platform are free; only around a third are paid-for or feature in-app purchases. Among those that do charge a fee, the most popular price was also the cheapest, at just 79p. Of the remainder, the vast majority are priced at £3.99 or less.

APP OF THE MONTH





[MAC APP]

DxO OpticsPro for Photos £7.99

Quickly correct lens errors before you edit further in OS X

Photos for Mac is the go-to place for quick photo editing and managing your photo library in the cloud. Whilst more serious tweaks need to be done in the likes of Photoshop or Affinity Photo, it often falls to iPhoto's replacement for quick fixes. DxO OpticsPro is a Photos extension that has a set of camera presets built-in to automatically fix distortion based on your lens type. So, if you shoot with a zoom lens on a Canon DSLR, say, OpticsPro will know that from a photo's EXIF data and fixes it accordingly. It works for all iPhone models too; the app knows what slight anomalies their lenses suffer from, both in colour and chromatic aberration.

There's also some simple lighting, noise and temperature corrections that can be made, all based on the information a photo gives the program about the type of lens used.



[iOS APP]

AUXY £3.99

This music-making app, in which you make loops and lay down drumbeats in seconds, was a hit on iPad. It has been rebuilt for iPhone to provide a better user experience in portrait orientation, and it also supports 3D Touch on the newest iPhones.

Why you need it: Incredible mobile music generation.

What's it best for: Creating electronic tunes on iPhone.



[iOS GAME]

LIFELINE: SILENT NIGHT £2.29

The original Lifeline game was one of the first to make use of the Apple Watch properly, with messages sent in real time from the game for you to respond to. Its sequel sees the return of Taylor, now aboard the ship that rescued him in the first instalment.

Why you need it: It's perfect for more casual gamers.

What's it best for: Making great use of Apple Watch.

[PODCAST]

SERIAL: SEASON 2 FREE

If the non-fiction podcast Serial has escaped your notice, you must have been living under a rock for the last year. Its second season focusses on a new case: uncovering the truth about the supposed US military deserter, Bowe Bergdahl.

Why you need it: Compulsive listening for crime buffs.

What's it best for: Hooking you in for all of its episodes!

APPLE TV

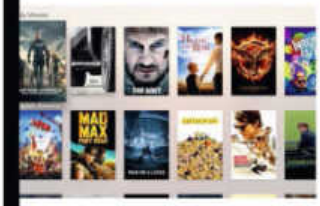
Our top picks of what's worth watching and playing this month



[MOVIE]

STRAIGHT OUTTA COMPTON £13.99

This biopic charts the rise and demise of NWA, a pivotal group on the US West Coast hip hop scene of the late 80s.



[APP]

INFUSE 4 FREE

If you don't like how Apple TV presents your videos, this app gives your library a fresh feel with better movie browsing and watching.



[GAME]

GEOMETRY WARS 3 £7.99

The iOS twin-stick shooter is now on your Apple TV. Blast away waves of enemies to your heart's content. A fast-paced classic.

iPhone IN NUMBERS

The world's most popular smartphone has reached an almost mythical status, as it has been one of the major driving forces behind Apple's stratospheric rise



30% switched from Android

› The iPhone 6s and 6s Plus are reporting the highest ever switch rate from Android smartphones. This figure was also quoted in the Q4 2014 financial results, with the iPhone 6s and 6s Plus being the catalyst for mass migration.

1,000,000,000 iPhones

1

› Apple is on course to reach this landmark sales figure for iPhone in 2016, likely before September's iPhone 7. During Apple's Q4 2015 financial results call, Tim Cook revealed a breathtaking 231 million iPhones were sold during the last 12 months alone. That stacks up against around 55 million iPads and 21 million Macs for the same period.



3

70% of all Apple's revenue

› Apple would be nowhere near its current size if it wasn't for the iPhone's unstoppable rise since launch in 2007. Apple's got more than $200 billion in the bank, and it's amazing that most of it is attributable to the iPhone.



4

Apple didn't always own 'iPhone'

› The 'iPhone' trademark was originally Cisco's, but that didn't stop Apple adopting the name. The two companies soon settled their dispute with a promise to collaborate in the future. That came to fruition in August with moves to make Cisco's networks and tools work better with iOS.

5

9:41am

› That's the default time set in all of Apple's advertising screens for iPhones, and it's the exact time that Steve Jobs unveiled the original iPhone in 2007 – but early iPhone marketing images displayed 9:42am instead!



NEXT ISSUE

Discover some of the most amazing facts about Apple's flagship computer - the iMac

ULTRA HD

Blackmagicdesign



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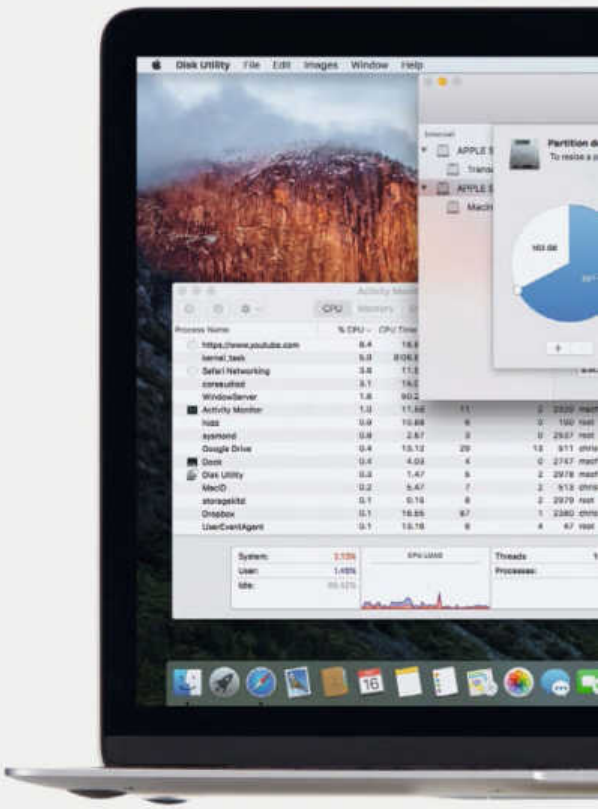
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Mac FORMAT INVESTIGATES

How reliable is your MacBook?

Compared to Windows laptops, there can be only one winner WRITTEN BY **ALEX BLAKE**



Three simple words have become something of a rallying cry among Apple users, a mini manifesto for our favourite devices: "It just works". Collectively they're a mission statement for products that are built to last. An ethos captured in 13 characters. So when Consumer Reports surveyed 58,000 American laptop users about their computers' reliability, it was no surprise to see Apple's MacBook Air and MacBook Pro sitting pretty at the top of the pile.

However, this was no close-run thing, no photo finish – Apple obliterated the competition. Between 2010 and 2015 (the period of the survey), the MacBook Air had an estimated failure rate of just 7%, and the MacBook Pro was hot on its heels at 9%. In contrast, the failure rate of the most reliable Windows laptop was almost double that of the Air – the Gateway NV range, which failed at a rate of 13%.

The positive feedback didn't stop there. The Consumer Reports survey also highlights that Apple customers use their MacBooks longer than their Windows counterparts use their laptops – typically 23 hours a week as opposed to 20. That further reinforces the news about failure rates because the extra workload doesn't cause them to wear out quickly. In fact, they also failed far less in the first year of use – around 3% compared to 10% of Windows portables.



The MacBook Pro fared only a little worse than the Air for reliability.

> This was no close-run thing – Apple obliterated the competition



Newer MacBooks use fewer parts, which means fewer points of failure.

What's the catch?

Before we get ahead of ourselves, we need to look a little closer at the results. One key difference between Apple and its PC rivals is that Tim Cook's company has its own range of retail stores. Could it be that what is deemed a laptop 'failure' in other brands – like sending off the device to the manufacturer for repair – is not recorded as such with MacBooks because they can simply be repaired at an Apple Store?

Not according to James McQueen of Consumer Reports. He told *MacFormat* that "a 'failure' was counted if a respondent's laptop [either] experienced a breakdown that was 'catastrophic' – the laptop stopped working or was not usable – or 'serious' – the laptop still worked, but poorly". Additionally, a 'failure' was also recorded if the laptop "had any of its original components repaired or replaced because they were broken".

Both of those criteria would cover taking your MacBook to an Apple Store for repair. The discrepancy between MacBook repair rates and those of other laptops lay not in the way that they were reported, but rather

IMAGE CREDIT: IFIXIT.COM



in the fact that MacBooks appear to be more resilient to failure.

Why is this? What makes MacBooks that much more reliable than other laptops? McQueen stated that Consumer Reports did not ask about the type of failures encountered by respondents. "We don't know if these failures pertain to hardware or software", he insisted, "or any particular parts or systems".

This muddies the waters somewhat. Did MacBooks fail less because OS X is less prone to 'catastrophic' errors, or because the hardware used in them is sturdier?

Really, it's a blend of the two. One major factor is likely to be malware. While it would be foolish to maintain the old stance that Macs don't get viruses, the much smaller market share occupied by them compared to Windows PCs makes them a much less attractive target to would-be hackers and other digital malcontents.

That somewhat unfairly sidelines Macs themselves. OS X is consistently rock solid throughout years of iteration, while Apple's innovative component design utilises fewer parts than previous MacBooks, meaning there are fewer points of failure. Apple picks hardware components that it knows will last, so while that Windows laptop may be a lot cheaper than a MacBook, it may cop out in next to no time. This is one instance where you really do get what you pay for.

Consumer Reports' survey revealed an astonishing low failure rate of 7% for the MacBook Air.



MacBooks are far more resilient in their first year

Consumer Reports also noted MacBooks are more expensive than their PC equivalents to repair, so it recommended Apple buyers invest in AppleCare when buying a MacBook. But when you consider the dramatically lower failure rates of MacBooks, that higher repair cost may not be such an issue. A PC may be cheaper to fix once, but if it breaks twice – or three times or more – then that cost saving quickly evaporates. A larger initial outlay repays itself in lower maintenance costs.

This is something backed up by the survey, which found that Windows laptops tended to need multiple repairs far more than MacBooks. Among those MacBooks that did break down, 42% did so more than once; however, that figure stands at 55% for laptops from other brands.

This all puts MacBooks in a very good position. They break down less than PC laptops and are far more resilient in the first year after purchase. While they may be more expensive to repair, the lower failure rate means they last longer, meaning the cost differential is less pronounced than it may at first appear.

So, you can go on loving your MacBook for longer because it just works.



ADAM BANKS...

GOING DEEPER THAN A FORCE CLICK WITH MUSINGS ON THE WORLD OF APPLE



› Like many musicians, Martin Green uses an iPad. Green is one third of Lau, a band that wins folk music awards made with a Maplin's branch-worth of self-assembled electronics.

I heard their second-to-last gig of 2015 at the Sage Gateshead, where Ronnie Spector happened to be playing the next room. When you think of Ronnie, you think of *Be My Baby* and its radical production by her sometime husband Phil, which compressed orthodox instruments in unorthodox combinations into a magnetic motor of sonic euphoria.

There's something of the 'Wall of Sound' in the harmonic cathedral constructed nightly, under Green's restlessly multitasking governance, by Lau. Spector had a full orchestra and a recording studio. Lau is three guys, and they do it live. And amid it all they still sound like a folk band, playing, as guitarist Kris Drever puts it, the music of a made-up country. It's worth seeing, if you get the chance.

Don't look for Green's iPad. It came out afterwards, on the merchandise stand, where Green mucked in to take PayPal for albums, T-shirts and the band's latest 'slide into capitalism', a Scottish-made hot sauce. On stage, nothing would have seemed less appropriate than swiping a touchscreen.

> In a year or two, haptic displays will mimic the friction of nib on paper

More than just a digitiser belongs under the artist's hands. What Drever brings with his Atkin J45 Rosewood or Godin 5th Avenue archtop isn't something you can get in GarageBand. Aidan O'Rourke's fiddle swoops over peat-aged melodies like a fighter plane through a glen, bow and fingertips coaxing dog-whistle harmonics and crackles of pizzicato. Green plays every part of his accordion, wheezing selkie sighs from the bellows, clacking the register switches for percussion.

Argue all you want about skeuomorphic user interfaces; they can reproduce the look, but they can't give you the feel. Is that about to change? With the advent of Force Touch on the Magic Trackpad, Apple Watch's taptics and 3D Touch interactions on the iPhone 6s, we're increasingly prodding and poking our devices, and being prodded and poked back.

The iPad Pro's Pencil takes us beyond gesture as mere symbol, capturing the flick of a wrist in lines that don't just circumscribe but writhe and burgeon. In a year or two, haptic displays will mimic the friction of nib on paper. But this is all weak sauce when you've seen a man hold the breath of a concert hall by plucking table forks wired to a box of oscillators, and then bend himself double for a frenzied squeezebox keyboard run.

If Apple is getting into car-making, I like to imagine grease-black gearbox parts leaving trails across Jony Ive's pristine white bench. Handling them might inspire new paradigms: grasp, torsion, heft, gross-motor wrangling. Mechanisms for the kinetic feedback that turns a tool into a limb. We'll see. But there'll never be a Turing machine of expression. The magic doesn't happen under the glass. It's out there in your own world of crazy invention.

ABOUT ADAM BANKS

› Adam is Apple to the core, having reported on the world of Macs since the 1990s. As a writer, designer, art director and print production contractor, he divides his time between the Northern Powerhouse and the Creative Cloud.



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innovation you

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Sync lights with music and movies

Light schedules for home automation

Light for your well-being



Hue White and Color Ambience Starter Kit

Works with Apple HomeKit

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PHILIPS

APPLE IN QUOTES

TIM COOK
apple.com

"You really want kids to learn these building blocks as young as possible and then build on them."
Apple's CEO on the Hour of Code movement

MARK MULLIGAN
musicindustryblog.wordpress.com

"Apple has managed to establish itself as the [market's] second player with astounding pace."
Apple Music's growth impresses an analyst

GENE MUNSTER
piperjaffray.com

"The combination of [the iPhone 6c and 7] along with the subscription service... is setting 2016 up to be a good year for Apple."
On the next iPhones and Apple's upgrade program

JONY IVE
apple.com

"You're just not as dexterous as you are with a pen or a pencil for certain things."
Design guru explains the reason for Apple's stylus

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SPLIT VIEW

The MacFormat team debates the hot Apple issues of the day, using their iPhones of course!

"WHAT DO YOU WANT TO SEE IN THE NEXT APPLE WATCH?"



Alan wonders if this button has a future on the Watch at all.

Christian hopes existing straps will fit Apple Watch 2.



Christian says...

Longer battery life. I don't run it down entirely in one day, but the goal should be two days' use before charge – but shaving off some bulk and still getting that is hard.



Alan says...

Yes, but with my 42mm Watch I'm going well past a day. 👍 It's going to be an issue in the same way it is for iPhone – Apple couldn't make a battery pack for the Watch!

I'd like more changes in watchOS than physical changes to the Watch. App launch times still need to be better and apps more independent of the iPhone. watchOS 2 was a bit of a disappointment. I'd like more Watch faces too. 😃

Yes the cool city time-lapse faces are good, but the novelty wears off quickly. I'd rather see new classic faces; after all, there are more straps available than those! 😡

I hope all the current straps will fit the second-gen Watch – I bought three of them, including the Milanese Loop. I also worry that if the Watch went much thinner than it is now, the Digital Crown would feel really awkward to use. 🤔

Apple could get rid of the button below the Crown, TBH 😮. It serves only one purpose (Contacts), something most people rarely access. I just use Siri to send messages and it understands me perfectly! 😃

NEXT ISSUE Do we really need the rumoured iPad Air 3?

Siri...ously?

"Hey Siri what's 0÷0?"

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If you love your iPhone as much as we do, you'll want to keep it powered up and full of juice for as long as possible. But using it everywhere you go can take you down to 0% awfully fast.

Fortunately, we've teamed up with mophie to make that a thing of the past. You can win a brand new 16GB iPhone 6s featuring Apple's amazing 3D Touch tech, plus two fantastic battery packs.

To ensure you never run out of power when you're on the go, we're giving you the chance to win a mophie juice pack H²PRO. While most battery packs are rather basic affairs, mophie's sturdy case boasts full waterproofing to a depth of 1.2m for 30 minutes. Its 2,750mAh cell provides 100% extra battery power, and it's even got military-grade drop protection to a height of 1.2m.

And for when you need to charge up at home, we've thrown in a mophie powerstation plus. This external battery can charge your iPhone eight times over at 2.4A, and comes with both Lightning and USB cables, so you can charge up two devices simultaneously.

THE QUESTION

For your chance to win this super-charged iPhone and battery pack bundle from mophie, just answer the following question:

mophie's juice pack H²PRO protects your iPhone underwater for how long?
A) 10 minutes
B) 20 minutes
C) 30 minutes

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- For full terms and conditions, go to futurecomps.co.uk/mophieiphone. By sending your entry, you agree to these competition rules and confirm you are happy to receive details of future offers and promotions from Future Publishing Limited and carefully selected third parties.
- This competition closes on 15 February 2016. Over 18, GB residents only.

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HOME GADGETS
Essential kit to bring your home and garden into the 21st century

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APPLE HOME



EDITED BY **CLIFF JOSEPH**

NEW SECTION!
The smart home is here – live the Apple dream today!

The home of the future is already here, with more and more smart devices that can save you money and make your home more comfortable than ever before



The great British winter is upon us once more – cold, wet and gloomy as ever. That's why we've decided to focus the first edition of Apple Home on the new generation of smart thermostats. As well as keeping you warm and cosy, these new thermostats can also save you a lot of money on your heating bill. And that's what Apple Home is all about.

Some home tech is all about fun – Apple TV and multiroom speaker systems let you create the perfect entertainment system. A smart lighting system can help create the right mood, but it can also save you money by turning itself off, should you forget to do so. Security systems can protect your home when you're away, and as Apple continues to develop its HomeKit technology you'll find that all these devices can work together to give you both comfort and control over the devices that you use in your home every day.

› GET STARTED WITH...

SMART THERMOSTATS

Winter is coming – but a smart thermostat can keep you warm and cosy and still save money on your heating bill

How much can I really save?

› Costing around £200 to £250, these smart thermostats need to earn their keep. Most manufacturers claim to offer savings of around 30% a year, so if you spend more than £600 per year on heating then you'll save around £200 in your first year. Of course, you'll continue to save money after that, too.

How do I install it?

› Most manufacturers say that you can install their thermostat yourself, although Hive's £249 price tag does include installation by a British Gas engineer. If you don't want the hassle then Tado and Nest charge an extra £50 for engineer installation, while Netatmo just adds another £20. Only Devolo leaves you to do it yourself.

It's only natural to want to stay indoors and keep warm at this time of year but, of course, that can mean running up big heating bills during the winter months. That's where the new generation of smart thermostats comes in, as these intelligent devices provide both comfort and control so you can make the most efficient use of your heating system.

A conventional thermostat simply sits on the wall and turns your heating on or off whenever it gets too hot or too cold. Some may also provide a timer option that turns the heating on and off at specific times during the day. The new generation of smart thermostats can do all those things, and they can do a whole lot more as well. Like every good gadget nowadays, smart thermostats are part of the Internet of Things (IoT), and they can connect to your home network so that you can control them with an app on your iPhone or iPad – even when you're away from home.



Thermo features

Most smart thermostats can be placed on a wall and used as a straightforward replacement for your existing thermostat. Some models have smart digital displays, such as the latest version of Nest's Learning Thermostat, with its intelligent Farsight display that automatically lights up when you enter the room. In contrast, Hive's Active Heating opts for a big, chunky dial that is meant to give it the familiar look and feel of an old-fashioned thermostat. The design is very much a matter of personal choice, but generally you can still control your boiler and heating system using the manual controls on the thermostat just as you've always done. One exception here is Devolo's new Radiator Thermostat, which, as the name suggests, connects directly to a radiator – rather than your boiler – so that you can control the heating in one room at a time.

> Like every good gadget nowadays, these smart thermostats are part of the Internet of Things

The real difference, though, is when you hook up your smart thermostat to your home network. This allows you to control the thermostat using an app on your mobile ›

Explained

Z-WAVE

You'll hear the term 'Z-Wave' a lot when reading about home automation technology. Z-Wave is just a low-power version of Wi-Fi that's used to save power in thermostats and other devices that run off AA batteries.



iFacts...

£1,239

The average energy bill for gas and electricity in the UK in 2012 (Office for National Statistics).

£750

Heating typically represents 60% of total energy bills – almost £750 per year.

55%

The increase in energy costs between 2002 and 2012 (Office for National Statistics).

30%

The typical saving promised by most manufacturers of smart thermostats.





The Nest thermostat contains a sensor that can detect nearby movement so that it knows when you arrive home or go out.

Is my boiler compatible?

The smart thermostats that we cover here typically claim to work with 95% of existing boilers and heating systems. You can check the individual manufacturer's sites for more details, but if you've got an existing thermostat wired onto a wall in your home then you can generally connect the new thermostat to the existing wiring without any problems.

What about my hot water?

Modern combination boilers generally heat both your radiators and hot water, but if you do have a separate hot water tank then the Hive, Nest and Tado thermostats can provide separate controls for hot water (although you may need to pay £79 for the Tado Extension Kit, depending on your existing system).

devices, such as an iPad or iPhone. This also allows control of the thermostat remotely over the internet when you're away from home.

The apps for all these thermostats share a number of basic features. You can use them just like a conventional thermostat, setting the temperature levels that tell the thermostat when to turn itself on or off. You can also create a schedule that suits your daily habits, perhaps turning the heating on just for a couple of hours every morning and then again when you get home in the evening. Most of these apps also allow you to create multiple schedules, so that you can have one schedule during the week when everyone is out at work or at school, and another for weekends when you may spend more time indoors. If there's a change of plan and you come home late one evening then you can simply use the app on your iPhone as a remote control to change the time or temperature settings as required.

> Nest can also monitor the way that you use it over time, so it can learn how warm you like to be

Home and away

These thermostats include many other useful features. A common one is 'frost protection' that can turn the heating up a little if the temperature drops low enough to freeze or damage your pipes. Hive also has a 'heat boost' option that can keep the heating going for longer if you want keep really warm and cosy during the cold winter nights. If you're going to be away for a few days then the apps from Netatmo and Devolo provide a holiday mode that turns the heating down until the date that you specify for your return.

The Nest thermostat gets really smart with an 'auto-away' option that uses a built-in sensor to tell when your home is empty. If you head out in the evening, it knows that it can turn the heating down even if it's normally on at that time. Nest can monitor long-term usage to learn how warm you like to be at different times of day and automatically adjust its settings to reflect your preferences.

The apps from Hive and Tado can track the movement of your iPhone or other devices. If you've got an early start one day and you leave home while the heating is on, Hive can send a notification to your phone reminding you to turn it off. Tado even responds to your movements when you're away, so if it sees that you're returning home earlier than usual it can override your normal heating schedule and automatically turn it on ahead of your return. If you're really obsessive about monitoring your energy usage then all of these apps can compile your usage data into reports that show where your biggest energy costs occur and where you can make even more savings.

The FarSight display on the Nest thermostat automatically lights up when you enter the room.



Tado's iOS app can use Location Services on your iPhone to tell when you're coming home and override your preprogrammed heating schedule.

FIVE OF THE BEST

We recommend the best five smart thermostats for you ›



Devolo Radiator Thermostat £230

devolo.com/uk

› This option connects directly to a radiator to control the heat in an individual room. You can buy it individually and program it manually for just £60, but you'll need Devolo's Starter Kit for network connectivity (£230 total price).



Hive Active Heating £249

hivehome.com

› Designed to look like an update to the traditional big-dial thermostat, this versatile option includes useful features such as frost protection and heat-boost for those cold winter nights. The price also includes installation by a British Gas engineer.



Nest Learning Thermostat £199

nest.com/uk

› The most well-known option, thanks to its $3bn takeover by Google. Nest sets the bar high, with a bright, attractive display and intelligent features such as 'auto-away', which monitors activity in your home. Installation is an extra £50, though.



Netatmo Thermostat £179

netatmo.com

› Netatmo's offering is a bit more basic than some of its rivals, but it has all the main features for scheduling and remote control of your heating. It's also one of the most affordable models, with engineer installation costing just an extra £20.



Tado Smart Thermostat £199

tado.com/gb/

› This thermostat's plain white control panel isn't much to look at, but it has one outstanding feature: it's the only one with a rental option – just £4.99 per month for the first year, then £7.99. There's also a 30-day money-back guarantee.

1

DO IT YOURSELF

› If you're handy with a screwdriver then you can probably install your new thermostat yourself. However, most manufacturers offer an installation service, typically costing between £20 and £50.

Nest gets really smart with 'auto-away', which uses a sensor to tell when your home is empty



2

INTERNET OF THINGS

› Network connectivity means that you can place your smart thermostat anywhere you want, and even control it remotely over the internet.

Explained

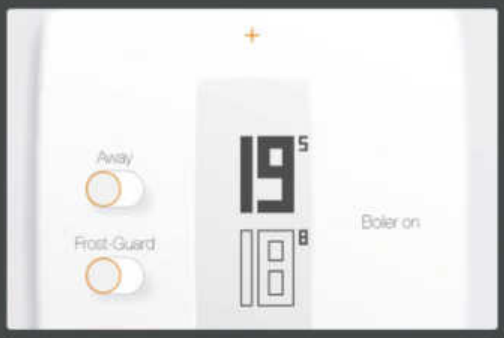
IN THE ZONE

› Larger homes can buy multiple thermostats to create a 'zoned' heating system that controls radiators in different rooms. Hive, Nest and Tado all support zoned systems, but the cheapest option here is Devolo's Radiator Thermostat, with additional thermostats costing just £60 each.

Genius Tip!

› To save time, most thermostat apps allow you to create a schedule for one day, and then quickly copy and paste that schedule onto other days as well.

HOW TO Program your smart thermostat ›



1 Hot stuff

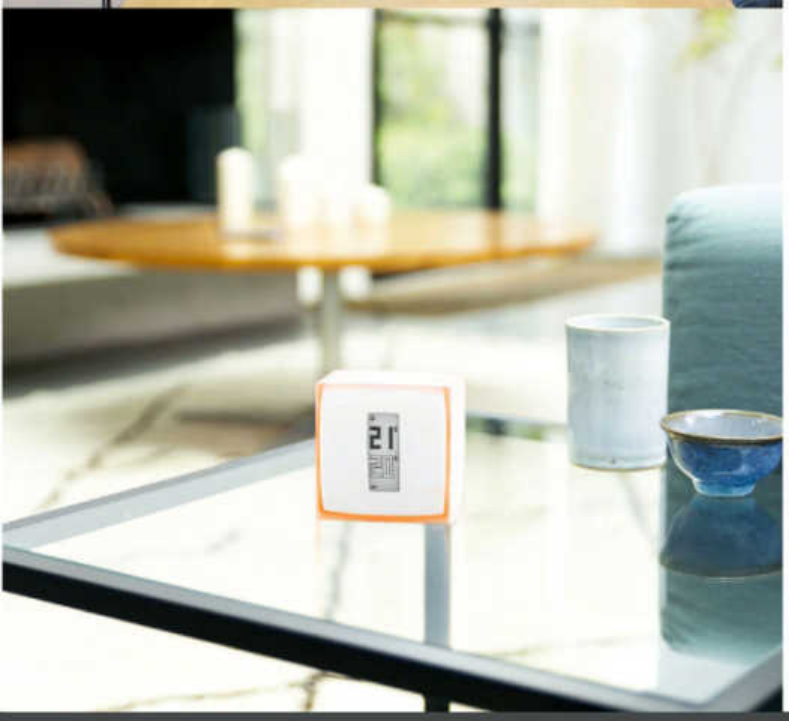
In the Netatmo Thermostat's app, the upper figure is our desired temperature and the lower one is the current room temperature. There's also Away mode for holidays, and Frost-Guard to protect your pipes in really cold weather.



2 On schedule

Each day can have its own schedule. The different colours represent temperatures you've set for different times of day – typically you'll want it on for a while in the morning, off during the day, and back on in the evening.





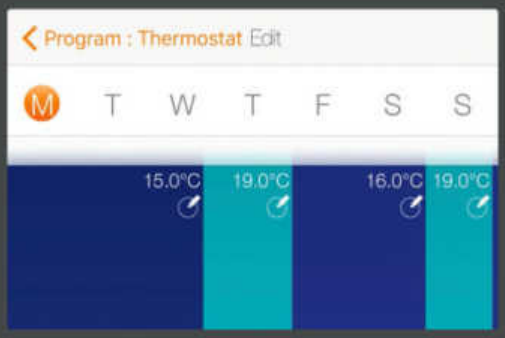
Wi-Fi connectivity means that you can move your smart thermostat wherever in your home you want it to be.

WHAT OTHER THINGS SHOULD I CONSIDER?

OFF THE WALL

One key difference between smart thermostats and the conventional type is that the modern kind can use Wi-Fi technology to go portable

The simplest installation option is to use the existing wiring to place your new thermostat on the wall in the same spot as your old one. Most smart thermostats also provide a special relay device that can connect directly to your boiler, and the thermostat can then send commands to the boiler via the relay. This means that the thermostat can go on any wall in any room, or even on a coffee table so you can adjust the heat without getting off your sofa. You may have to pay extra for it, though. Tado's Extension Kit is £79, while Nest includes a relay but needs a £29 stand if it's not screwed onto a wall. Netatmo doesn't have Nest's eye-catching display, but its price includes a relay, and its smart design by Philippe Starck looks great on a coffee table.



3 Out and about

You can use your iPhone to change your heating schedule remotely. If you decide to go out after work, you can change the schedule for that evening so that the heating doesn't come on until you're heading home.



4 Economy mode

You can create as many heating settings as you like; perhaps a 'cosy' setting for when everyone is at home, and others for night and mornings. Some apps offer an eco-mode that saves money by lowering the temperature.



Jargon Buster

Some thermostats offer a 'geolocation' or 'geofencing' option that can use GPS on your iPhone to create a perimeter around your home. When you leave the perimeter the app will tell your thermostat to turn the heat down, and to turn it up again when you return home.

› WHAT YOU NEED NEXT...

HOME GADGETS ›

Indoors or outdoors, here's the tech you need to create your new smart home

For even more smart home advice subscribe today!
See page 46

Elgato Avea Flare

£90

elgato.com

1

You can buy Elgato's Avea light bulbs on their own, and use these power-efficient multi-coloured LED bulbs to jazz up your existing light fittings at home. However, Elgato is also planning a range of Avea lighting products that provide additional features, starting with the portable Flare.

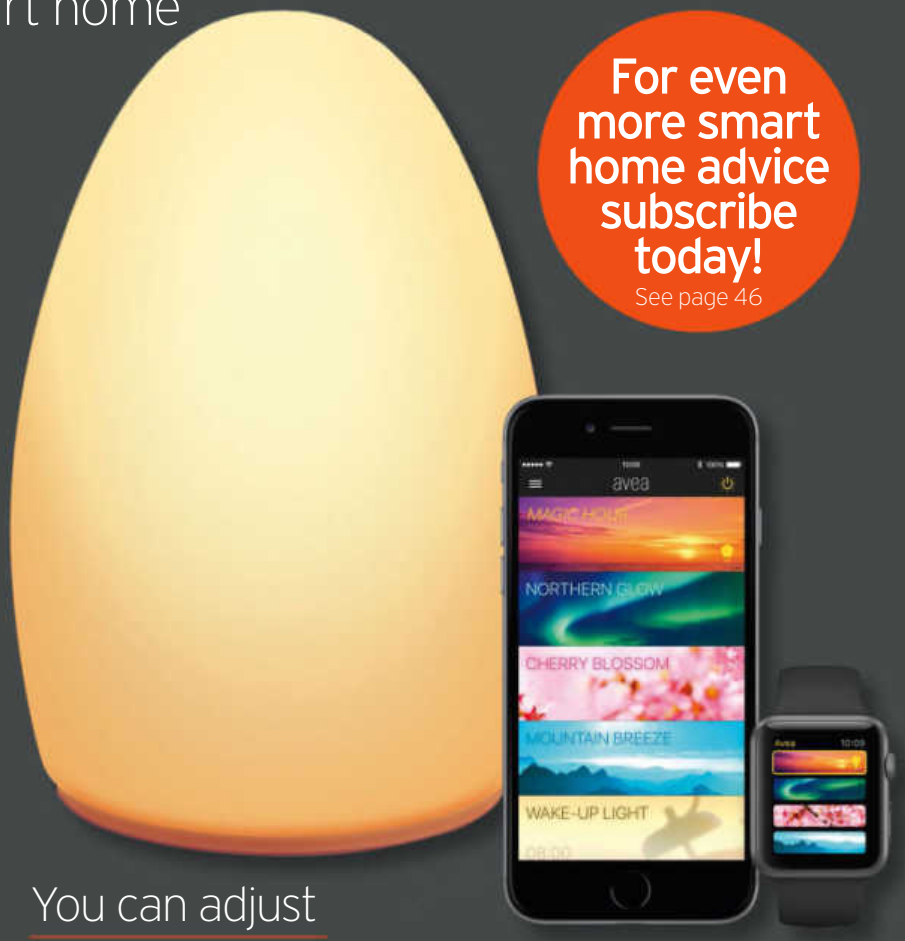
The pod-shaped Flare stands 22cm tall and has a built-in rechargeable battery, so you can easily pick it up and carry it from room to room. Its battery will last for about eight hours with the Flare at maximum brightness, or a bit longer on lower settings. The Flare's housing has an IP65 rating for water-resistance – similar to many of the 'rugged' hard drives that you can buy for your MacBook – so you can use it outside in the garden for a bit of after-dinner mood lighting as well.

In complete control

Like the Avea bulbs, the Flare uses a Bluetooth connection and the Avea app to connect to iOS and other mobile devices. As well as simply turning the Flare on and off, the app can control multiple Avea devices, allowing you to have different lighting settings in different rooms. There's an app for the Apple Watch too, so you can put your feet up and control the Flare without even having to take your phone out of your pocket.

You can adjust brightness and colour settings yourself, but the Avea app also includes a number of preset lighting effects, such as Magic Hour, which simulates the gentle orange glow of sunset, and Northern Glow with its shifting shades of blue and green. There's also a 'wake-up' mode that eases you gently out of sleep in the morning by gradually raising the light level in your bedroom.

The Flare is relatively small to keep it portable, and it's really just designed for gentle mood lighting. If you need a larger or brighter system then the separate Avea bulbs provide light levels closer to a traditional 60W lightbulb – but consume just 7W each!



Apps for iOS and the Apple Watch let you set the mood with a variety of preset lighting effects.

> You can adjust brightness and colour yourself, but the app also includes preset effects



The Flare has a rechargeable battery so you can move it between rooms.



Noke £60

noke.com

3

The idea of a Bluetooth padlock might sound a bit daft, but it works better than we expected. You can set the Noke (no-key) to auto-unlock when it detects your iPhone nearby, but the best feature is the ability to share control of the lock with people that you trust. You could use the Noke to lock a shed and then grant access only to your family. The Noke app allows you to control multiple locks and assign different access settings to each lock. It's sturdy and weather-resistant for outdoor use, and there's a larger version called the U-Lock designed for bikes, too.



Robomow £999

johnlewis.com

2

The Robomow is pretty costly, but it'll earn its keep if you have a big garden that you need to keep under control. Its iOS app acts as a remote control so that you can put your feet up while Robomow does all the work. The app allows you to divide a large garden into smaller zones with different mowing routines for each zone, and also includes a special mode for trimming around the edges of your lawn. There's a rain-sensor that can tell it to take cover when it starts raining and, for extra safety, the blades stop automatically if the Robomow bumps into an obstacle, or if its blades are lifted up off the ground.



Neato Botvac Connected £549

neatorobotics.com

4

Neato's latest robot vacuum cleaner really sucks – thanks to the new turbo mode designed for heavy cleaning jobs. Alternatively, this model also has a gentler eco-mode that you can use for light cleaning in order to preserve battery power. As its name suggests, the Botvac Connected can connect to your home Wi-Fi network so that you can control it from your iPhone even when you're out and about. You can set regular cleaning schedules using the Botvac app, or just turn the Botvac on for a quick run around the living room before you get home from work.

Smart ideas IFTTT

'If this...then that' is a standard programming procedure, used to ensure that one action is followed by another if a condition is met. It's also the idea behind IFTTT, a system that can be used to connect smart devices so that they work together. You can use the IFTTT app, or ifttt.com, to create 'recipes' that combine devices and actions. Many home automation devices work with it, so you could use the auto-away feature of the Nest Thermostat to create a recipe that says – 'If Nest sees that I have left home then turn off my Philips Hue lighting system'. Recipes work with lots of other devices too, such as fitness bands and sleep monitors.

That's very similar to the way that Apple's HomeKit is supposed to work, but Apple is still taking its time getting HomeKit ready for mainstream use. The disadvantage of IFTTT is that it needs a bit of work to create recipes that connect all of your devices, so there's a real opportunity for HomeKit to succeed if it can provide the same ease of use as most other Apple products.

NEXT ISSUE Make more of your tunes with a multiroom wireless sound system...

YOUR MAC REBORN

Look after your Mac and it will give you years of faithful service. **NIK RAWLINSON** shows you how to make it last longer.



Macs are renowned for running and running. They last longer than most PCs thanks to Apple's obsessive focus on backward compatibility in every version of OS X, so although they may cost more up front, they often work out cheaper in the long run. If you want proof, look no further than this feature, parts of which were written on a G4-powered anglepoise iMac that's about to turn 13 years old. It doesn't have Wi-Fi or Bluetooth, but it still connects to the internet, and runs enough legacy software to do a full day's work. All of that and it still looks great.

Over the course of the next 13 pages we'll show you how, by taking good care of your Mac, you can extend its useful life and make sure it's always running at its full potential. To help you navigate our advice, we've provided three tracks through some of the sections to focus on different types of user – Mac Addicts, Switchers and Hangers-on – so check the profile descriptions to the right to see which of these best describes you.

Although we'll be recommending a few common-sense hardware upgrades here and there, and the occasional app, a lot of what we recommend is simply good housekeeping that won't cost you anything. As ever, we're not assuming that you have any prior knowledge or expertise either, so don't be afraid to roll up your sleeves and get stuck in.



FOR MORE ADVICE SEE
GENIUS TIPS!
Turn to page 69 for our new troubleshooting section.

WHICH MAC USER ARE YOU?

THE HANGER-ON



You like things to last. You may be running a Mac with a G4, a G5 or an early Intel processor. Software updates for it are rare, but it's easy enough to open to upgrade its memory and storage. You appreciate that your Mac 'just works', and you don't want to risk doing anything to change that.

THE SWITCHER



You probably switched to a Mac from a PC within the last couple of years and are still discovering things about it. You may have bought a Mac mini and kept your old keyboard and mouse, making you the kind of person that Apple had in mind for it. You may still be on your first Mac and reaching the point where it needs a spring clean.

THE MAC ADDICT



You're the kind of Mac user the rest of us envy, being first in the queue for the latest hardware. If you desire a Mac Pro, we'd guess you're frustrated by the lack of a recent upgrade, leaving you with a dilemma: do you keep your current barrel-shaped Mac rolling, or switch to something else? Our advice is to hold out for now.



CLEAN UP YOUR MAC

Deleting old files can massively improve your old Mac's responsiveness

When your Mac's memory starts to get full, it temporarily dumps its contents onto your hard drive for retrieval later on. Naturally, if your drive's filling up, it won't have much room to do this, so it will spend a lot of time shuffling data backwards and forwards, which will slow down your whole system.

A good rule of thumb is to keep 10% of your drive's total capacity free for this purpose. You can achieve this by archiving old files to external storage. You can also use utilities like CleanMyMac 3 (£35, macpaw.com) to flush out old log files and automatically remove unnecessary hidden data, such as foreign language localisations of your apps, old log files and system caches.

Also, get into the habit of reviewing and emptying your Trash at least once a week.

SECURELY ERASE AN OLD MAC

Don't give away personal data with your old hardware

Emptying the Trash doesn't delete your files – it just tells OS X it can reuse the space where they sit, should it be needed in future. In reality, the files and data stay on your drive until overwritten, which could be months or years later, during which time anyone you pass your Mac on to can use recovery tools to get them back.

On Yosemite and earlier, securely empty the Trash from the Finder's application menu. This feature has been removed in El Capitan – largely due to not working on some systems – but you can securely erase the whole drive from Disk Utility. Select the drive in the sidebar, click Erase, then Security Options, and then drag the slider to specify how many times the drive should be overwritten with useless data.



Securely erasing a drive writes over so-called blank space with useless data.



SELL AN OLD MAC

Fund your Mac upgrade by selling your current model

You should always wipe your Mac completely before selling it, to ensure you've removed all of your personal data.

Restart while holding down ⌘+R to enter the Recovery system. Open Disk Utility from the Utilities menu and securely erase the Mac's internal drive (as described above) to remove all of your data and the operating system.

Quit Disk Utility, and then use the option to reinstall OS X to set up a clean copy of the system. When it restarts, resist the temptation to run through Setup Assistant; leave this for the new owner as they'll need to enter their personal details.

REINSTALL OS X

Sometimes a fresh start is the only solution to a very stubborn

THE HANGER-ON

Things are a little more complicated on older Macs



If you're running Mac OS X 10.6 or earlier you won't have access to the Mac App Store, so you can't download a fresh copy of OS X directly. You won't have a Recovery system, either, so you can't use its OS X installer. Instead, put your original installation DVD in the drive and hold down C while restarting to start up from the optical disc. This will almost certainly be slower than your Mac's usual startup disk, so be patient.

If you're reinstalling because you've been having problems with your storage (and, if possible, you've taken a recent backup), open Disk Utility to erase your Mac's storage at this point. (Beware: only do this if you've backed up, since all of your data will be erased from the drive).

Once that's done, return to the OS X installer's screen, click Continue, then work your way through the steps to begin the installation.

THE SWITCHER

If you've ever reinstalled Windows, you'll feel right at home



Recent versions of OS X create a hidden partition on the hard drive in which they store a minimal version of the system in case an emergency reinstall is required. You'll already be familiar with this concept from Windows, as modern PCs are frequently supplied without accompanying media.

To reinstall OS X, restart and hold ⌘+R when you hear the startup sound. This starts up your Mac in the Recovery system rather than the regular one. Use its features to verify your drive (to diagnose errors), restore your Mac to a previous state from a Time Machine backup, or reinstall OS X from scratch.

If Recovery is damaged, some Mac models (see http://bit.ly/mfintrec) can download an Internet Recovery system when you hold ⌘+⌥+R instead when you hear the startup sound.

THE MAC ADDICT

Get ahead of the game with beta versions of OS X



If you're an advanced user, follow the steps outlined for Switchers to reinstall OS X on your Mac. Also, consider signing up for Apple's beta programme so you can install forthcoming releases before the masses. (Make sure you're happy running pre-release software first.)

Visit https://beta.apple.com and sign in with your Apple ID, then download the El Capitan Public Beta Access Utility from http://bit.ly/mfapplbspr. Run this to enrol your Mac in the beta programme so it will see pre-release updates – your other Macs using the same Apple ID but not enrolled won't receive them.

Once enrolled, major versions are provided as installer apps, and minor versions are downloaded from the Mac App Store's Updates tab. When using unfinished software, regularly copy your files to external storage – not with Time Machine though, as it may have bugs.



UPGRADE MEMORY

Some decisions are best made before you buy your Mac



THE HANGER-ON

There's good news and there's bad news

Old Macs are the easiest Macs to upgrade, because they were built before Apple started sealing its cases and soldering components onto the logic board. The bad news, though, is that the older your machine is, the more difficulty you may have in finding new memory. Crucial, who we recommend for most memory upgrades, didn't have the memory we needed to boost our 13-year-old anglepoise iMac G4, so our only option was to revert to second hand sites like eBay and Gumtree.

We have less confidence buying second-hand memory as you don't know its history and can't tell how carefully it was removed from the original host computer. However, if you decide to go down this road, we'd still recommend using a memory finder tool – either the manual Advisor Tool or the automated, downloadable System Scanner – from Crucial (http://uk.crucial.com) before you start, as even if the company can't supply the parts you need, the results it throws up will tell you what you need to buy and how to access the memory compartment on your Mac.

If you can store another computer, it may well be worth trying to pick up a duplicate of your old Mac on eBay to cannibalise for spares over the next few years, as parts will only get scarcer.



THE SWITCHER

Success depends on the age of your Mac

If you're running a Mac mini, then so long as you don't have the most recent model (introduced late 2014, and non-upgradable) you can access the memory slots by using the thumb notches to twist off the black plastic base (see the instructions here: http://bit.ly/mfminimem). Install new memory modules in pairs of matching capacity.

If you're running a recent iMac, there's a button on the back of the case that pops open a door behind the stand. This is where the memory is located. On older flat-screen (not anglepoise) iMacs, you'll find it by unscrewing a plate on the bottom of the display using a regular Phillips screwdriver. **Apple maintains lists of compatible memory for each iMac model at http://bit.ly/mfimacmem.**

If you're using a 2013 Mac Pro, check our instructions for Mac addicts (below). For Mid 2012 and earlier models, unlatch the side using the levers at the back and refer to http://bit.ly/mfmpmem to determine its memory type. Memory is on an expansion board that slots into the logic board at the bottom of the case.

The memory in recent MacBooks (including the Air, and Pro models with a Retina display) can't be upgraded after purchase. In older models it's usually seated below the keyboard. See Apple's various guides at http://bit.ly/mfmbmem.



THE MAC ADDICT

With modern Macs, your options are limited depending on the model

As a Mac addict you almost certainly know that the smart shopper specifies their memory at the point of purchase if they're buying the most recent Mac mini, a 21.5-inch iMac, or a portable. If you're buying a 27-inch iMac or a Mac Pro, check prices from suppliers like Crucial (http://uk.crucial.com), which are often more affordable than Apple's own memory prices, as long as you're happy to install the modules yourself.

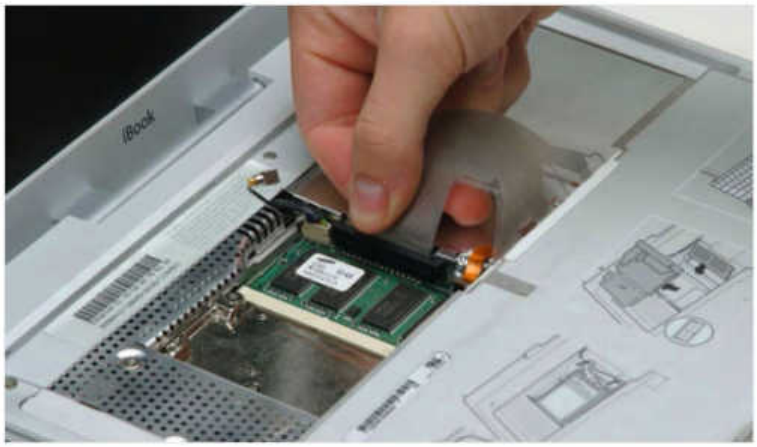
For all non-upgradable Macs, consider how long you intend to keep your Mac and how you think your needs will change over time. If you're going to upgrade every couple of years, we would usually recommend aiming for the middle spec in any line-up, as these often appeal to the broadest range of buyers.

If you're running an iMac, check out our instructions for Switchers (above) on upgrading your memory.

For a Mac Pro (2013 model), you'll need to buy unbuffered UDIMMs or registered RDIMMs (don't mix the two types). Shut down the Mac and allow it to cool down, then use the latch on its back to unlock the cover. Slide the cover upwards to remove it, then use the table at part 2 of Apple's support document (see http://bit.ly/mfmp2013mem) to install the correct memory module combinations in the four slots.



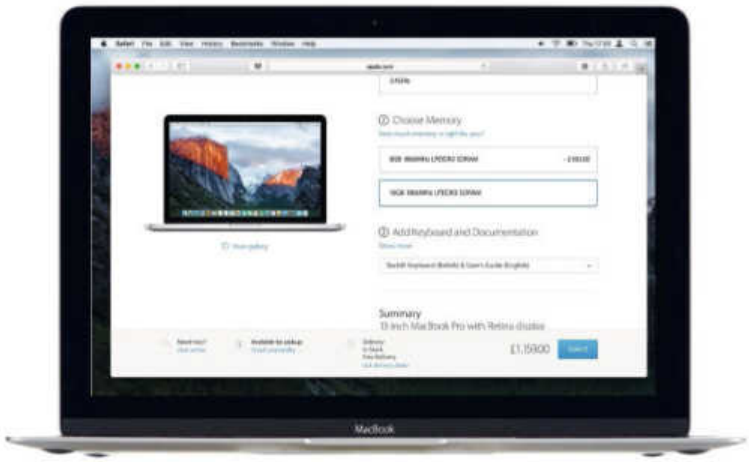
IMAGE CREDIT: iFIXIT



The internals of older Macs are easier to access, but replacement parts are harder to find.



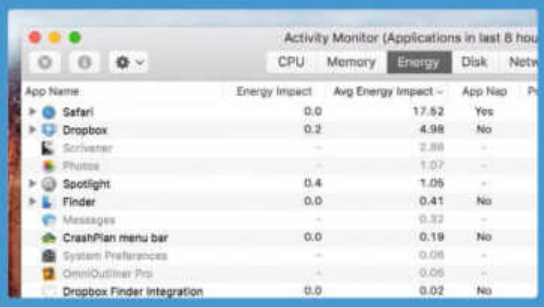
Memory in old-style Mac Pros and Mac minis from before October 2014 is easy to replace.



For many new Macs, you must specify required memory when buying the computer.

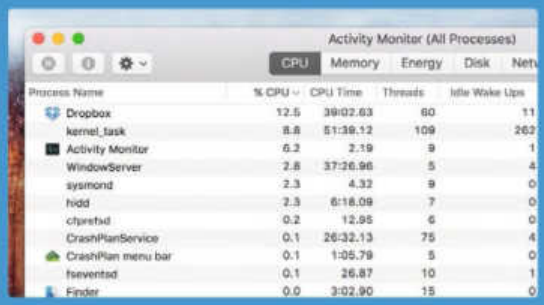
ACTIVITY MONITOR

Your secret weapon against an unresponsive Mac



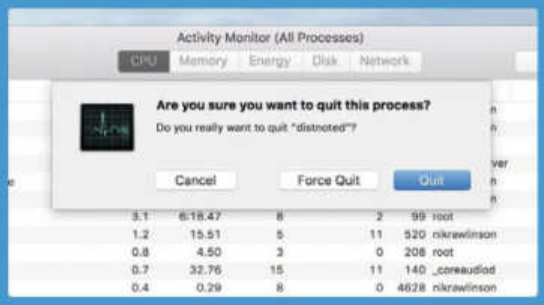
1 Identify resource hogs

Activity Monitor shows you which processes (including background operations and active apps) are accessing the processor (CPU), memory, storage and network, and which are consuming the most power, which is useful if you're using a laptop.



2 At a glance

Click the heading at the top of a resource's column to arrange processes with the most greedy at the top. If your Mac is running slowly, diagnose it in the CPU and Memory tabs. If your hard drive is very busy, click Disk to see what's accessing it.



3 Kill... with caution

To halt a resource hog, select it and then click the 'X' button on the toolbar. Be careful: you'll be forcing it to quit, which risks losing data. Anything with 'root' in the User column is a core system process; killing it may cause other issues.



UPGRADE STORAGE

Every hard disk will die someday...



THE HANGER-ON

It's time to give your hard disk a health check-up

Unless you've replaced it already, your Mac's internal hard drive could well be approaching the end of its life. It won't be expensive to replace in a five- to 10-year-old Mac (storage prices are falling all the time), but replacing the data on it, in the event of catastrophic failure, could prove impossible. Now is the time to do something about it.

Start by connecting an external drive and manually dragging your files across to it to create a copy of them, if your version of OS X doesn't support Time Machine (that feature requires OS X 10.5 or higher). Also **consider making a bootable copy of your drive** by following the instructions for Switchers (below).

Of course, the drives in the drilled aluminium Mac Pro and the PowerMac with mirrored drive doors are the easiest to replace, requiring nothing more complex than a Phillips screwdriver.

Many **older MacBook Pros (pre-unibody) and PowerBooks can also be upgraded by removing the keyboard** – but be very careful with the ribbon that connects the trackpad as it's easily creased.

Acquiring a standalone replacement drive for a very old desktop Mac may not be economically feasible: we've seen prices of over £400 for 128GB units. Again, consider buying an old Mac from eBay to cannibalise for spares.



THE SWITCHER

Think outside of the box for relatively fuss-free expansion

Upgrading the internal hard drive in modern Macs isn't to be taken lightly. It's not possible on all models, and even on those where it is, it's not always easy.

The most recent iMacs are officially not upgradable, although as sites like EveryMac have found, it can be done (see http://bit.ly/1XfW6Df), and recent notebook Macs are effectively sealed units. It's even less practical to upgrade the internal storage in a Late 2014 Mac mini than with earlier models. It is possible, but the process is long and involved – the guide at http://bit.ly/mfminihdd illustrates just how much.

So, unless you have a Mac Pro, **we'd recommend attaching external storage using a USB port (or USB-C on the latest MacBook) and storing your personal files there**, reserving your internal drive for the operating system and apps, from which they'll open more quickly.

If you need an external startup disk (perhaps as a temporary measure to overcome a problem prior to having your Mac repaired), **use Carbon Copy Cloner (bombich.com) to create a bootable duplicate of your internal drive**, then keep it connected to your Mac and restart the computer, holding ⌥ at the startup sound. When shown the available startup disks, use the arrow keys to pick the external drive, then press ↵.



THE MAC ADDICT

Hang on a minute – where's the hard disk?

You might imagine that, with its removable casing, the barrel-shaped Mac Pro would be relatively easy to upgrade in this regard, but that's not so, primarily because it doesn't use a standard hard disk or SSD. Instead it houses a single storage connector that takes SF3700 PCIe-based flash storage.

Once you've removed the enclosure you'll find the flash storage attached to the right-hand graphics card, held in place by a single T8 Torx screw. (You can get a T8 Torx screwdriver cheaply on either eBay and Amazon.) The storage itself looks like a thick stick of regular memory, and once unscrewed it can be lifted straight up, out of the connector. Don't try and lever it out at an angle or you risk damaging the contacts inside the connector, which will require an expensive repair. Install the replacement perfectly vertically, too, for that reason.

It's not an inexpensive operation. Megamac sells a 1TB upgrade for £800 and a 2TB upgrade for £1,249 (http://bit.ly/1R7VXwM). If these prices are too rich for you, **consider a NAS drive attached to your router if you need lots of capacity**, perhaps to share among several Macs, or make use of one of the six Thunderbolt ports on the back of the Mac Pro itself to directly attach some fast external storage.

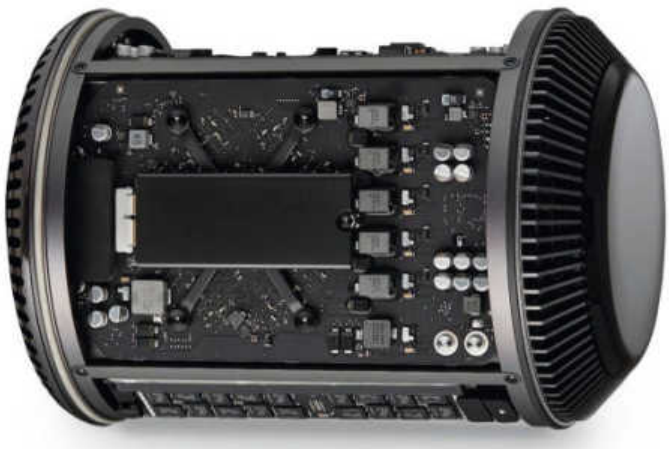




Replacing the drives in older Macs is often less daunting than recent models.



External storage using USB, Thunderbolt or USB-C is often the easiest upgrade option.



The block on the bottom of the 2013 Mac Pro's right-hand graphics card is for connecting storage.

INTERFACES EXPLAINED

So you can connect storage to your Mac with confidence



PATA

Parallel ATA has a blue connector on a grey ribbon cable. It's used in older models of Mac Pro to connect drives to the logic board.



SATA

Serial ATA has a black connector on a red ribbon cable. It's used to connect drives at higher speeds than PATA, which it replaced.



USB

Universal Serial Bus is a robust port that's used to connect external devices: printers, scanners, storage, media players, and more.



FIREWIRE

Also known as IEEE 1394. Developed by Apple, used on the original iPod, and once a stalwart of the video community; increasingly rare.



THUNDERBOLT

A high-speed interface used to connect monitors, storage, and also able to power peripherals. It can also be used to network two Macs.

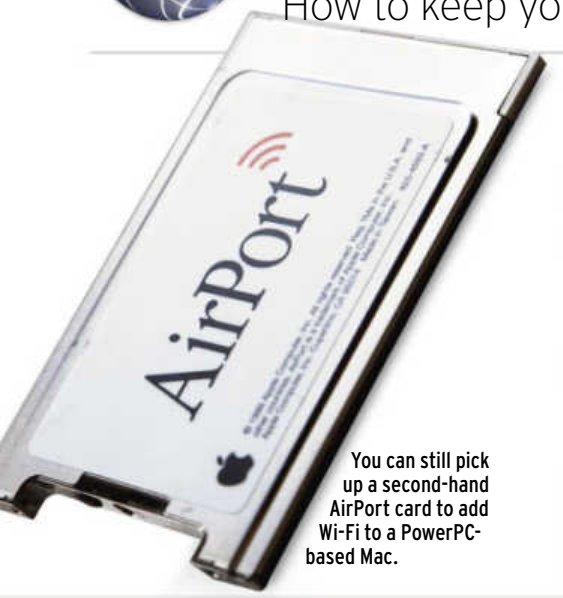


USB-C

A small port used on the 2015 MacBook for charging the battery and connecting peripherals. Thunderbolt 3 will use the same connector.

NETWORKING

How to keep your Mac on the internet and talking to other computers



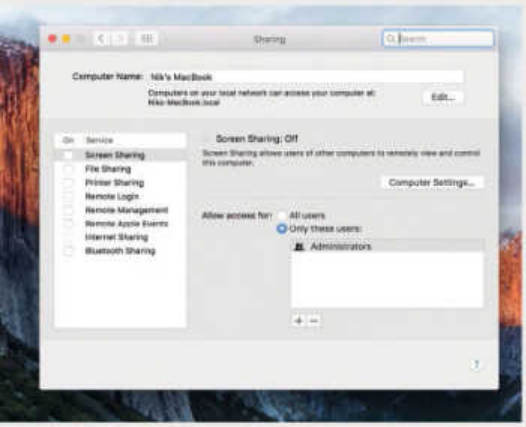
You can still pick up a second-hand AirPort card to add Wi-Fi to a PowerPC-based Mac.

THE HANGER-ON

Get different generations talking to each other

The earliest Macs of the new generation (introduced immediately after Steve Jobs' return) had Ethernet but lacked Wi-Fi. **Apple fixed this in 1999 when it introduced AirPort**, an optional add-in card for the iBook, which was later added to the PowerBook, eMac, iMac and Power Mac. **If your computer was produced between 1999 and 2003 (when AirPort Extreme debuted), you need the original AirPort card**, which you can pick up on eBay for around £10 (search for part number M7600LL/A).

Recent versions of OS X offer several protocols that enable one Mac to connect to another, including SMB, NFS and FTP, but Macs running OS 9 or earlier only support AFP (Apple Filing Protocol), which is a development of the original AppleTalk networking protocol. This isn't supported natively in OS X Lion and later versions as it's



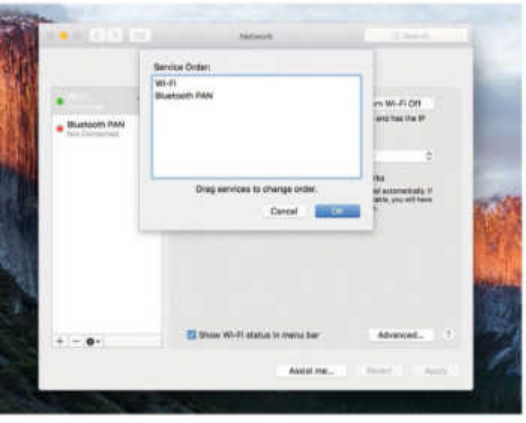
You can find out a Mac's Bonjour name at the top of the Network pane in System Preferences.

THE SWITCHER

Sharing files between OS X and Windows is easy

Networking in OS X is refreshingly simple. The built-in Bonjour protocol makes your Mac visible to other Macs on your local network as soon as you enable File Sharing in the Sharing pane in System Preferences. You can find a list of other visible computers on your local network in the sidebar of any Finder window. If none are listed there, put the pointer over the Shared heading and then click Show.

To share files with other Macs, drop them into your account's Public folder. To interact with another Mac's screen, press ⌘+K, or select Connect to Server from the View menu, and enter `vnc://` followed by its IP address or Bonjour name (which the other person can look up for you by opening System Preferences' Sharing pane again and checking the line below Computer Name. To browse their file system, use `smb://`



Click the cog in the Network pane to set the priority of your Mac's various connections.

THE MAC ADDICT

A health check will keep you running at top speed

If you've set up a variety of network interfaces over the years, including Wi-Fi, Ethernet, FireWire and tethered mobile phone networks, you might not realise that your Mac cycles through each of them until it finds the best connection, which can slow things down. Removing unused interfaces and specifying your preferred order can remedy this.

Open System Preferences' Network pane, click the cog below the list of interfaces and choose Set Service Order, then drag your preferred interfaces to the top (Wi-Fi followed by Ethernet would be a sensible arrangement).

Install Little Snitch (http://bit.ly/1DOeHtQ) to monitor the traffic passing into and out of your Mac, and authorise or block each app or port in turn until you cut off the over-talkative processes.

Make sure you're using the fastest connection type supported by your



less secure, so you'll have to resort to entering commands in Terminal to get new Macs talking to legacy machines. Refer to http://bit.ly/mflegacyafp for the commands that achieve this.

After following those steps, you can connect to your older Mac by typing afp:// followed by its IP address. If you want to connect to an AppleTalk server, you'll instead need to use afp://at/ followed by the server's AppleTalk name.

in place of vnc://. Note that for both of these latter connection types you'll need a valid username and password.

With Sharing enabled on your Mac, it's also accessible from your old PC. Connect them to the same network, open Windows Explorer, then expand Network in the sidebar and your Mac will appear alongside other shared devices. Likewise, your PC will be visible on your Mac under Shared in Finder's sidebar.

router (the latest Macs all have 802.11ac networking) and consider enabling MAC (media access control) address filtering on your router so that only specified wireless devices can connect, blocking casual interlopers that might hog your bandwidth. **You can find a MAC address by choosing About this Mac from the Apple menu**, clicking System Report, then Wi-Fi, and copying the string beside MAC Address under 'en0'.

PROBLEMS WITH PERIPHERALS

Helping Switchers diagnose device dilemmas and acclimatise to the Mac environment

If your external devices work with Windows 7, 8 or 10, they'll almost certainly work on the Mac, and they should be detected automatically. **To switch to a USB audio device, hold ⌥ (Alt) while clicking the speaker icon in the menu bar.** If that icon isn't present, choose System Preferences from the Apple menu, click the Sound icon, then choose your audio interface in the Input and Output tabs.

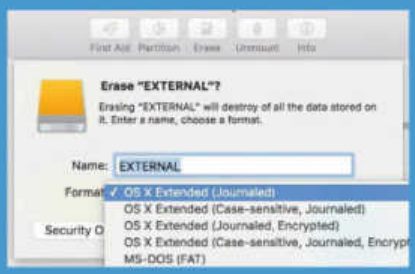
Click Printers & Scanners in System Preferences to add those devices. Drivers download when you connect a device and add it using the + button. **Updates to drivers are delivered through the Mac App Store's Updates tab.**

Before moving an external drive from your PC to your Mac, back it up on your PC and consider reformatting it using Disk Utility on your Mac – use the 'OS X Extended (Journaled)' format. You can then copy the old data back to it over your network. If you'll still need to use it with the PC, format it as MS-DOS (FAT) if its up to 32GB, and ExFAT if it's larger – it will then be writable on your Mac as well.

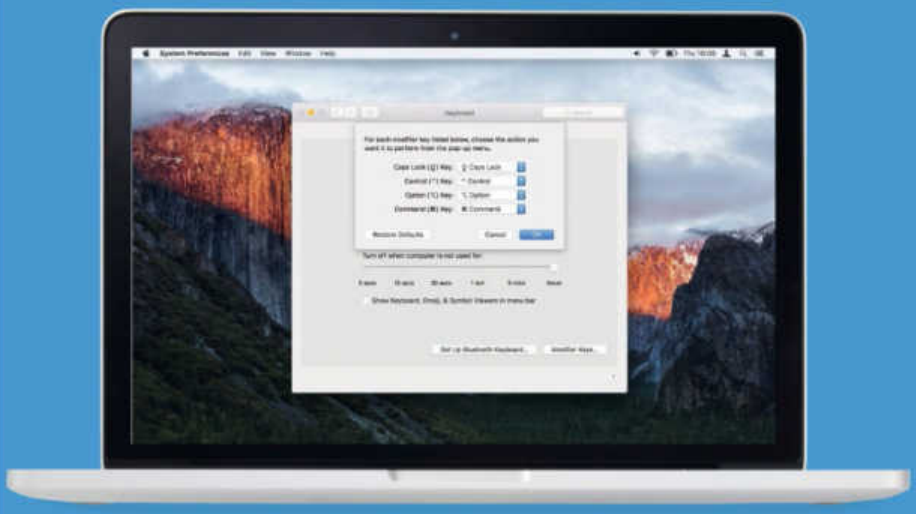
Windows keyboards don't have a ⌘ (Command) key, but they have a Windows key instead. OS X usually gets on okay with them, but if you find some keys are misrecognised – say, Alt and Ctrl are switched – **remap them by clicking Modifier Keys in System Preferences' Keyboard pane.**



Hold ⌥ and click the speaker icon to choose from the available sound inputs and outputs.



Choose an appropriate format when setting up a drive for Mac or cross-platform use.



If you're using a Windows keyboard on a Mac, you may need to adjust the modifier key assignments.

WHICH BROWSER?

Running an up-to-date web browser helps you to stay safe online

THE HANGER-ON

Understand the risks of running an outdated web browser on a Mac



Firefox 3.6 is the most recent version that will run on your PowerPC-based Mac.



Safari 9 only works on Macs running Mavericks and later, so if your OS is older you're out of luck. Meanwhile, support for versions 6.2.8 and earlier (for Mountain Lion and before) has been discontinued.

The most recent versions of Chrome and Firefox support operating systems **as far back as Snow Leopard (10.6),** so if you're running 10.6 to 10.8 we recommend switching to one of those.

Further back

If you need to go back further, consider **TenFourFox (http://bit.ly/1IvVWy2),** which runs on Macs with PowerPC G3 processors and later, yet supports HTML5 and promises fast JavaScript performance. It requires Tiger or Leopard, while a sister project, **Classilla (http://bit.ly/1IjAg09)**, supports OS versions all the way back to 8.6, allowing you to keep truly ancient Macs online. **The latest official release of Firefox for PowerPC processors is 3.6**, which, although no longer supported, can be downloaded from http://mzl.

THE SWITCHER

It's easy to sync your favourites across several platforms



You can change your default web browser in System Preferences' General pane.



First, the bad news: if you've got used to Internet Explorer on Windows, you won't find it on the Mac. Microsoft ended support for its browser on Apple's operating system 10 years ago. (It can still be downloaded from http://bit.ly/UnQfwM but **it won't work on modern versions of OS X.**)

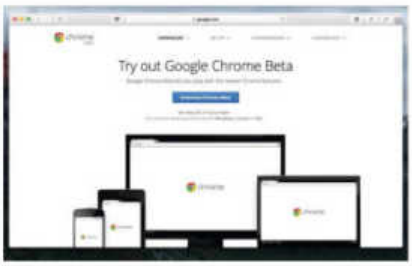
If you need to work **cross-platform we would recommend that you switch to Chrome** (Apple discontinued the Windows version of Safari in 2012) so you can synchronise your favourites and search history between your Mac and Windows PC by signing in to the same Google account on each.

Default browsers

That won't automatically change your default browser, so to redirect clicked links in emails and messages to **Chrome instead of Safari,** open System Preferences, click General and select Chrome from the 'Default web browser' pop-up menu. To replace it with Chrome, open that browser, hold ctrl and click its Dock icon, then choose Options > Keep in Dock.

THE MAC ADDICT

Stay ahead of the crowd with the latest web technologies



Running a beta browser alongside your regular one lets you test your web design will hold up.



You can install as many browsers as you want on a single Mac, but why would you want to? The most obvious benefit is that **doing so lets you sign in to multiple accounts for the same services** simultaneously.

It also means you can preview forthcoming web technologies, which is a boon for web developers to be able to check that their work won't be obsolete a few months down the line. You can download beta versions of Chrome from http://bit.ly/1NQQPI3 and Firefox from http://mzl.la/1IjzhIZ. Beta releases of Safari are only available to registered developers by signing in at http://apple.co/1QAIf66.

Lasting longer

A word of caution, though: Although we haven't been able to independently verify it, GBatteries Energy reckons that you'll get an extra hour of usage from a MacBook's battery if you stick with Safari. See its blog post at http://bit.ly/1DbZUwd for details of its investigation, which includes illustrated comparisons. Incredible if it proves true!



EMAIL TWEAKS

Find the best way to read your email on Macs of different ages

THE HANGER-ON

Webmail may be your best option for reading email on very old Macs



Webmail tends to have low requirements, so it's often the best option on a very old Mac.



Mail might not look much different on your vintage Mac to the way it does now, but it has changed significantly under the hood. **You can't index messages using Spotlight if you're not running at least OS X 10.3 Panther,** your IMAP downloads will be far less responsive if your Mac is not running OS X 10.5 Leopard, and you have no Microsoft Exchange Server 2007 support without OS X 10.6 Snow Leopard. So, it pays to update to the most recent version that's available or, if possible, manage your messages using a web browser.

Older mail

If you need a new email app for an earlier operating system, **check out OldApps (http://bit.ly/1SmsEc)**, which maintains download links for Mozilla Thunderbird going back to version 1.5.0.2, which runs on PowerPC-based Macs and OS X 10.4 Tiger. Alternatively, Tenfourbird is a PowerPC build of Thunderbird – the most recent updates for which were posted in April 2015, which you'll find at http://bit.ly/1R8wxPx.

THE SWITCHER

Migrate messages from a PC that's using a Microsoft mail app



Migration Assistant has you covered when it comes to transferring mail from a Windows PC.



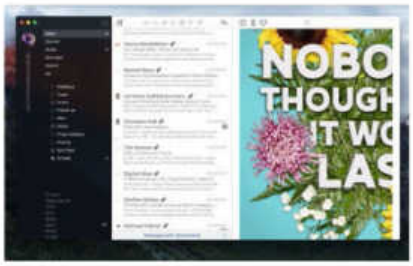
Outlook is available on the Mac as part of Microsoft's £7.99 Home or £5.99 Personal subscriptions to Office 365. The simplest way to move your data from Outlook on Windows to Outlook on the Mac is to **export your mailbox as a PST file,** copy this to your Mac using an external drive, and then choose File > Import in Outlook for Mac and select the exported file.

Migrating your email

If you're happy to use OS X's default Mail app, use Apple's Migration Assistant for Windows 7 and 8, available from http://apple.co/1XtpsZA **(a Windows 10 version hasn't yet been published).** It will connect your Mac to your old PC over your local network and copy across your existing data. Where Outlook and Outlook Express are concerned, the assistant imports your 'People' to Contacts, your 'Appointments' to Calendar, your email messages to Mail, and your POP, IMAP and Exchange account settings to the Accounts tab in Mail's preferences.

THE MAC ADDICT

Apple Mail is good, but a leaner app may help you to work faster



AirMail 2.5 is an excellent and fairly inexpensive alternative to Apple's own Mail app.



Mail is a competent business email client, but we favour Airmail 2.5 (£7.99, airmailapp.com) as we find it faster and, thanks to its **default behaviour of hiding folders in whatever accounts are not selected,** less distracting. You can also hide the message window so it looks more like a Twitter client, which helps it take up less space on smaller screens.

Clients for Gmail

If your email use is solely Gmail – or Google Apps-based, **consider Go for Gmail,** which is free from the Mac App Store (http://apple.co/1IjJb70) and effectively wraps Gmail's web interface in an application window, so you can keep it in the Dock.

You can also save a direct link to the address of your webmail service by dragging the site icon from your browser's address bar to the Dock, dropping it to the right of the divider. If your default browser is Safari 9, go to the site, hold ctrl and click the tab, then select Pin Tab. It'll shrink to show an icon and stay persistently open and updated at the left of the tab bar.

oppo



PM-3



BDP-103D
BDP-105D

Award-winning personal audio & home theatre innovation

Planar Magnetic Headphones	Universal Blu-ray Players	Headphone Amplifiers



PM-2

PM-1



HA-2

oppodigital.co.uk

MEDIA SERVERS

Streaming from a Mac is more versatile than a standalone box

FOR MORE SEE **LOVE YOUR MAC** page 77



iTUNES SERVER

Share your music over your local network

› iTunes has local sharing built in, using either Home Sharing or simple library sharing. The former exposes your library to everyone on your network who signs in using the same Apple ID on a Mac, iOS device, or Apple TV; the latter makes your music available without an Apple ID, and allows you to restrict which playlists are available and set a password. **Home Sharing requires the latest versions of iTunes and iOS,** but library sharing has been available since iTunes 4.0.1, so it's the best choice if you have Macs of different ages.



1 Simple sharing

Open iTunes' Preferences (press ⌘+,), click Sharing and check the box next to 'Share my library on my local network' to expose your media over your network.



2 Restrict contents

Click the circle next to 'Share selected playlists', then set which to make available. Optionally, select 'Require password' and enter one to restrict access to your library.



3 Home Sharing

Pick File › Home Sharing › Turn On. Enter your Apple ID details. Access your library on other Macs near the top-left of iTunes, and in the category selector in My Music on iOS.



4 Play counts

Home Sharing can update play counts when you play a track on another device. To enable this, check the box at the bottom of iTunes' Sharing preferences.

REMOTE CONTROL

Quickly turn an old Mac into a multipurpose media centre

› Revive an old Mac mini by using its HDMI port (or an Mini DisplayPort to HDMI adaptor) to connect it to a TV. This gives you a media server that's capable of streaming content to the big screen in your living room without you having to invest in an Apple TV. As a bonus, **you can also use it to stream any catch-up service** that's accessible through a web browser, or which has its own Mac app, such as BBC iPlayer.



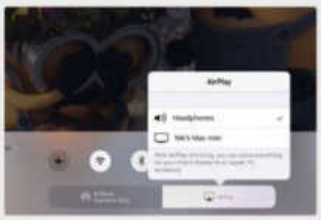
1 Share your photos

Use a Photos album – your own or one shared with you – as your TV's screen saver by setting Photo Library as the source in System Preferences' Desktop & Screen Saver pane.



2 Remote control

Apple's Remote app for iOS (free, http://apple.co/1T7HqzC) can control what's playing in iTunes on your Mac from your iPhone or iPad, even if you can't see your TV.



3 Stream from iOS

Install AirServer (£8.99, airserver.com) on your Mac, and iOS devices – and other Macs, too – will see it as a remote display, allowing you to stream to it directly.

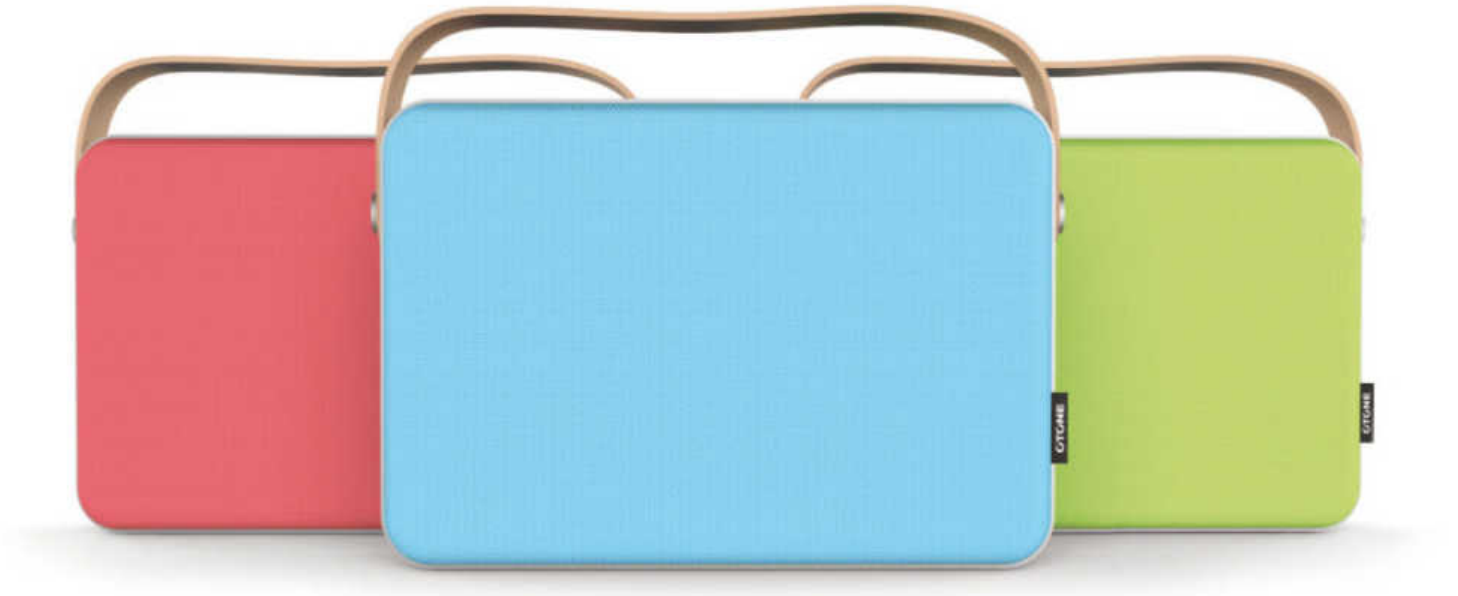
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QUICK RESCUE

When all else fails, try these remedies for common issues

1

CHECK YOUR PERMISSIONS

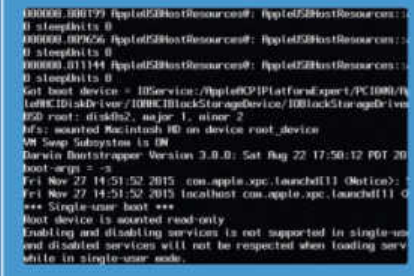
If your account lacks permission to access a file, it can cause an error or a crash. Prior to El Capitan, open Disk Utility, click your startup disk, then First Aid > Repair Permissions to check every file. OS X El Capitan repairs permissions itself.



2

BRUTE FORCE CORRECTIONS

If step 1 doesn't help, restart your Mac and hold ⌘+S when you hear the startup sound to start up your Mac in single-user mode. When it finishes starting up and you reach single-user mode's command line, enter `fsck -fy` and then press ↵ to check file permissions. Once the process has completed, enter `reboot` and press ↵ to restart your Mac as normal. It's sometimes necessary to run through this process more than once, so don't panic if the problem initially persists.





3

RESET YOUR PRAM

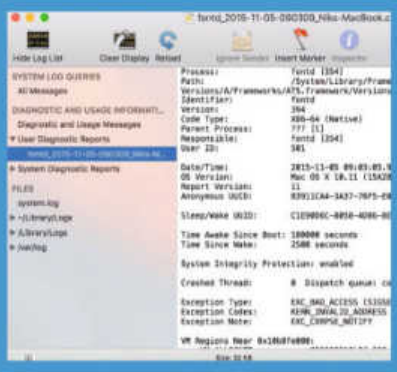
If your Intel Mac is forgetting display resolutions, speaker volume, and so on, shut down and then hold ⌘+⌥+P+R. While holding them, turn on your Mac and keep the keys held until you've heard the startup sound twice, then let go. This flushes out certain saved settings, resetting them to their defaults.

4

APPLE SUPPORT

Apple's online support pages (apple.com/uk/support) are easy to understand and startlingly comprehensive. You can download replacement user guides for everything from the Macintosh LC 550 (1994) to the Apple Watch by visiting https://support.apple.com/manuals.





5

USE THE CONSOLE

You Mac obsessively logs everything it does. You can view its logs using Console (found in the Utilities folder) and export reports for individual apps from the Diagnostic and Usage Information section. Supplying logs to tech support staff along with your help requests will aid them in remedying your problem.

6

ASK FOR HELP

It's impossible to overstate the value of Apple's Genius Bar support desk. Just make sure you book in well in advance – particularly at weekends.



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APPLE SKILLS

EDITED BY **ALAN STONEBRIDGE**



NEW SECTION!

Your new-look guide to getting more from your Apple kit



MASTER AFFINITY PHOTO p54

Understand iOS gestures

A *tap* is a brief contact of (usually) one finger on your device's screen.

To *drag* is to move a finger across the screen to scroll or pan around content.

Swipe means move one or more fingers across an item or the screen, then let go.

A *flick* is like swiping, but it's quicker, and is often used to scroll content more quickly.

Pinch means move two fingers together or apart, usually to zoom in or out.

Touch and hold means lightly rest your finger on an item and wait for a reaction.

Master Mac keyboard shortcuts

When you see a shortcut like ⌘+⌥+C, hold all but the last key, then press that one.

⌘ is the Command key, which is also labelled *cmd*.

⌥ means the Option key, labelled *alt* or *opt*.

ctrl means the Control key, labelled *ctrl*, and shown as ^ in shortcuts in the menu bar.

⇧ is the Shift key, which is typically just labelled *shift*.

← means the Delete key, which deletes to the left of the insertion point. Press fn+← to delete to the right.

⇥ is the Tab key, which shifts the focus between *some* controls in windows and web forms. Turn on Full Keyboard Access in System Preferences to jump between *all* controls.



Overhaul the Today view

Make Notification Centre work better for you with these widget tips

IT WILL TAKE
› 15 minutes

YOU WILL LEARN
› How to use and customise Today view in Notification Centre.

YOU'LL NEED
› OS X 10.10 or higher

Some of the best widgets for Today view are made by third-party developers

The Today view in Notification Centre was introduced in OS X Yosemite to mirror the one in iOS. Not a lot has changed in El Capitan, but are you using it properly?

Today view is reached by clicking on Notification Centre's icon, which is rightmost in the menu bar, then clicking the Today tab at the top of the slide-out pane that appears. While originally intended as a place to go to find out what's happening today, it has become a repository for all kinds of widgets from Apple and third parties. To some extent, it's taken the place of the deprecated (but not yet defunct) Dashboard, which, while no longer shown in Mission Control by default, can be reinstated in System Preferences.

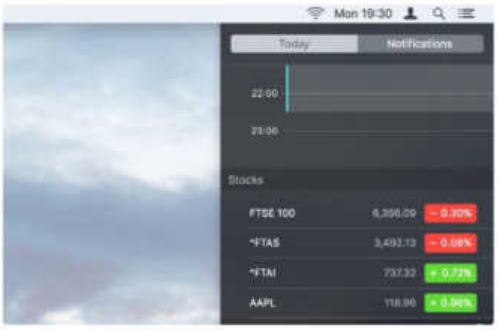
The broad range of widgets that have found a home in Today view means its name is now a little misleading, though its unlikely thinking of a better one is a priority for Apple. Among the widgets that keep within its name's remit are one for checking the weather, one for Reminders, and one for Calendar. Others, like Calculator and World Clock are very useful but not really about today's agenda.

Some of the best widgets for Today view are made by third-party developers. These include one for James Thomson's venerable PCalc, one for the to-do manager Wunderlist, and one for Deliveries, the Mac version of Junecloud's excellent delivery tracking tool.

Carpe diem

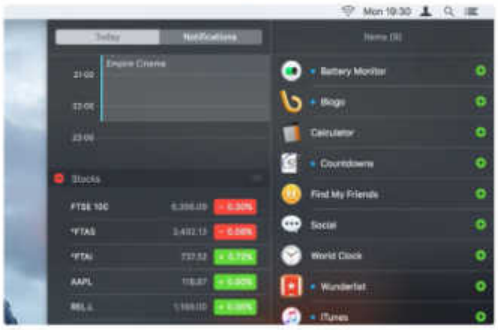
If you find yourself using Today view a lot, it's worth spending time organising it so that it works as well as it can for you. If you use a MacBook, MacBook Air or MacBook Pro, for example, the relatively small vertical screen space that's available means you'll be limited to viewing only a few widgets at a time. You can, of course, scroll down to see more, but as Today view is supposed to be an 'at a glance' feature, keeping your most needed widgets at the top of the list makes sense. Fortunately, rearranging widgets, as well as customising their content, removing them, and adding new ones, is straightforward. **Kenny Hemphill**

HOW TO Get more from widgets



1 Reorder widgets

Click Notification Centre's icon and then Today. The default view has some of Apple's widgets, such as Calendar and Reminders, already in place. To reorder them, click on the title of one and drag it up or down the list.



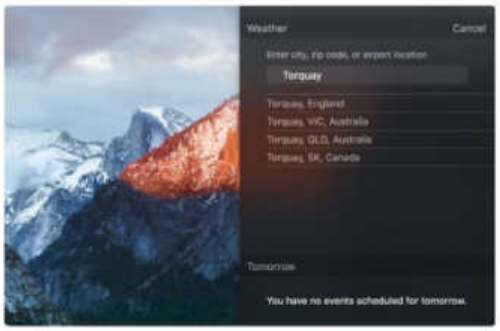
2 Delete widgets

At the bottom of Today view, click Edit ('New', if apps you've added include widgets) to reveal a list of unused widgets on the right. To remove a widget from Today, click the – (minus) next to it. It will join the unused list.



3 Add widgets

Click the + next to an unused widget to add it to the list, then drag it up or down, as in step 1, to place it where you want it. To find more apps that include widgets, click the App Store button at the bottom of the view.



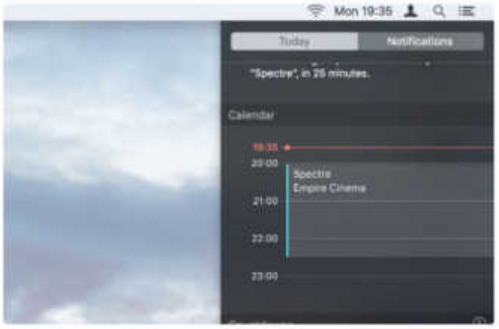
4 Customise widgets

Some widgets, like Stocks and Weather, can be customised. Put the pointer over a widget; if an 'i' then appears to the right of its name, click that. Click – (minus) to remove an item or + at the bottom of the list to add one.



5 An eye on battery health

If you use a MacBook, keeping an eye on its battery's health is essential. Battery Monitor (http://bit.ly/mfbatmon) allows you to do just that in Today view. Download it free from the Mac App Store and add its widget, as in Step 3.



6 Count down to an event

Countdowns (http://bit.ly/mfcntdwns) is also free from the Mac App Store. It allows you to specify an event, its date, and its time too, if you want. It then shows you in Today view how long is left until the event begins.

Jargon Buster

Widget is the name given to the individual elements in Today view, just as it is for windows in Dashboard. It remains to be seen whether they will eventually replace their Dashboard counterparts altogether in OS X.

Genius Tip!

You can create your own widgets. A Reddit user (http://bit.ly/1lLOgjB) has made available a widget that displays the output of a shell script in Today view. So, for example, you can view the contents of your Clipboard, headlines from an RSS feed, or the time elapsed since your last restart. You'll find example scripts at (http://bit.ly/mfextnotif).

Unlock hidden OS X features

Use Terminal to customise your Mac more than Apple otherwise allows

IT WILL TAKE
15 minutes

YOU WILL LEARN
How to activate hidden settings that improve your Mac experience.

YOU'LL NEED
OS X 10.11

Many of these hidden features are so good we feel a bit lost without them



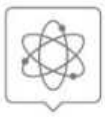
Delve into System Preferences or the preferences of many Mac apps and you'll find a lot you can customise. Curiously, though, many commands and features are hidden from you, especially when it comes to Apple's own apps. Outside of Apple, no one knows why. Perhaps these things aren't considered fully baked, or Apple believes they would negatively impact the user experience. We disagree – many of these hidden features are so good we actually feel a bit lost on a Mac that doesn't have them activated.

Mostly, the commands in this walkthrough require using Terminal, found in /Applications/Utilities. You'll need to be careful when typing them because even a missing character may result in an error message. Note that if you want to reverse one of these commands you can; in some cases, do so by entering the same command again, but with capitalised values reversed (so YES becomes NO, and TRUE becomes FALSE). Also, if you want to run a command multiple times, such as the one in the first step, you can go back through your previous entries by pressing the ▲ key. Additionally, rather than typing a path to a folder, such as in step 5, just drag the folder from Finder onto Terminal's window to have the full path to that folder added at the insertion point.

Deeper secrets

We only have space for eight steps, but there are many other hidden features for the Dock. Single app mode, in which clicking an app's icon hides other apps, can be activated with `defaults write com.apple.dock single-app -bool TRUE; killall Dock`. You can have the Dock only show apps that are open with `defaults write com.apple.dock static-only -bool TRUE; killall Dock`, and remove all apps that normally stick around in the Dock by entering `defaults delete com.apple.dock persistent-apps`. (Only do that when sure!)

Using `defaults write com.apple.dock scroll-to-open -bool TRUE; killall Dock`, you can use scroll gestures on top of icons, for example to activate Exposé for an app, or to open a stack. If you find the auto-hidden Dock slides back into view too slowly, enter `defaults write com.apple.Dock autohide-delay -float 0; killall Dock`. Entering `defaults delete com.apple.dock; killall Dock` restores app icons that were in the Dock when your Mac was new. **Craig Grannell**



Genius Tip!

If you need to perform multiple calculations, run several instances of Calculator with `open -n /Applications/Calculator.app` several times. (You can do this for any app, but take care with more complex ones; some apps act oddly when multiple instances are running.)

HOW TO Unlock hidden features





1 Add spacers to the Dock

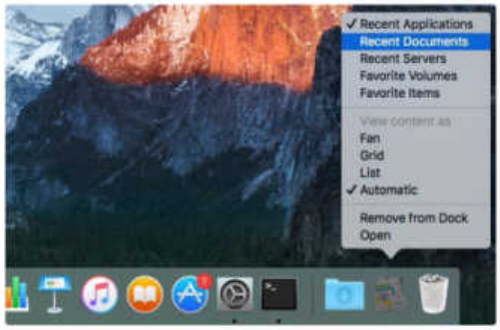
Enter `defaults write com.apple.dock persistent-apps -array-add '{"tile-type"="spacer-tile";}'; killall Dock` to add a blank tile to the Dock. Drag it to organise Dock icons in groups. Drag it out of the Dock to delete it.

2 Distinguish hidden apps

Enter `defaults write com.apple.Dock showhidden -bool YES; killall Dock` and icons of apps you hide (using ⌘+H) will be semi-transparent – useful, not least because hidden apps don't appear in Mission Control.

CONTINUED... Unlock hidden features



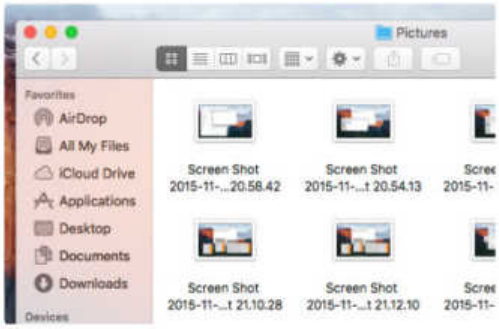


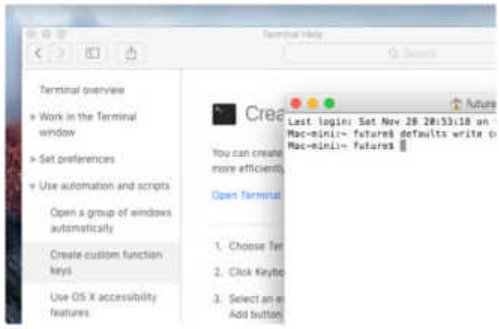
3 Create a 'recents' stack

Enter `defaults write com.apple.dock persistent-others -array-add '{"tile-data" ={"list-type"=1;}; "tile-type"="recents-tile ";}'; killall Dock` to add a stack that contains recently used apps to the Dock.

4 Customise the stack

Hold ctrl and click your stack to choose whether it displays recent apps, documents, servers, favourite volumes, or favourite items, and to adjust its presentation. Enter step 3's command to have more than one of these.



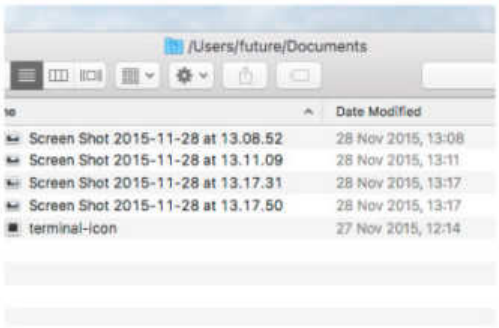


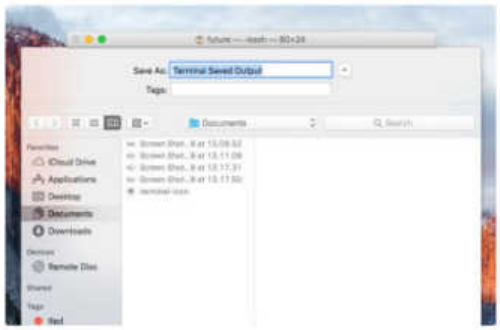
5 Move your screenshots

Screenshots are saved to your desktop by default. Change this with `defaults write com.apple.screencapture location path; killall SystemUIServer`. Replace 'path' with your preferred location, such as ~/Pictures.

6 Normalise Help Viewer

The Help window sits above every other window, which is irksome if you have limited screen space. Make it act like a standard OS X window by entering `defaults write com.apple.helpviewer DevMode -bool TRUE`.





7 Make paths prominent

If you want a folder's path to be more prominent than with View › Show Path Bar, enter `defaults write com.apple.finder _FXShowPosixPathInTitle -bool YES`. Paths are then be displayed in Finder title bars.

8 Expand Save dialogs

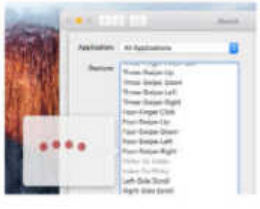
If you dislike Save dialogs defaulting to the collapsed view, force them to be expanded with `defaults write -g NSNavPanelExpandedStateForSaveMode -bool TRUE`. This takes effect in each app when you next save.

Jargon Buster

› Terminal's **defaults command** provides access to preferences for OS X and apps, which are stored in PLIST files. You can use `read` to view the one of these files as a whole – for example, using `defaults read com.apple.dock` – or to check a value for a command mentioned elsewhere in this tutorial by swapping out 'write' for 'read'.

Genius Tip!

› Unlock the untapped power of your Mac's trackpad with apps like BetterTouchTool (boastr.net), MagicPrefs (magicprefs.com) and jitouch (jitouch.com). These enable you to configure dozens of trackpad gestures to perform all kinds of actions – far more than Apple gives you in System Preferences.





Master Affinity Photo

The first of our five-part guide to Serif's Photoshop-challenging editor

IT WILL TAKE
› 1 hour

YOU WILL LEARN
› How Affinity Photo is laid out and differs from Photoshop. How to use Photo's adjustment layers to edit your photographs non-destructively.

YOU'LL NEED
› OS X 10.7.5 or higher

NEXT MONTH!
› Learn how to master adjustment layers

For some time, photographers tempted by Photoshop were faced with a stark choice: stump up for Adobe's flagship image editor, with the attendant £9 per month subscription price, or hunt desperately for an affordable alternative. Other options were thin on the ground to say the least – until Serif arrived with Affinity Photo. Benefitting from a vast range of professional-grade features, as well as a simple-to-understand £39.99 price (including, according to Serif, free updates for two years), photographers who want more than the simple editing options on offer from OS X's Photos app, but who don't want to commit to Adobe's more expensive software, finally have a powerful alternative.

Over the next few issues we'll be taking a deep look at Affinity Photo – if you've got experience with Photoshop you'll find it does a few things differently, and if you're looking to get started on a more powerful editor, this is the perfect place to begin. First, we'll look at getting started with Affinity's different 'personas' to open a RAW file and give it a first pass in preparation for a more in-depth edit.

Pixel perfect

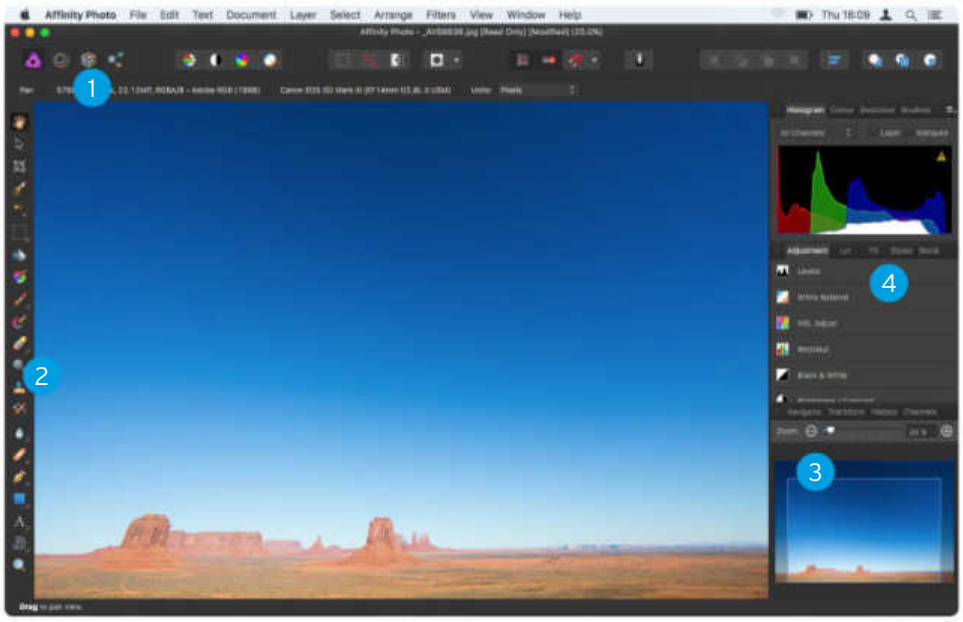
At its heart, Affinity Photo is a per-pixel image editor. That means, unlike Adobe Photoshop Lightroom or Apple's Photos, it's designed to allow you to attack an image a single pixel at a time, if that's what you want to do. That means you can do things that are hard in other apps, such as removing objects that you don't want in your photographs, or even impossible, such as selecting an area of one image and cutting it out for use in another. So, Affinity Photo offers you an incredible amount of power: with a bit of patience you'll be able to get your images looking precisely how you want them.

That isn't to say that editing photos with the app needs to be laborious. If you want to quickly change how an image looks – say, its exposure, white balance or saturation – you can do so without trawling through endless menus. This flexibility means you could quickly find

EXPLAINED... Affinity Photo's main window

1 Personas
Each reveals a different set of tools. You'll find the Photo, Develop and Export personas the most helpful.

2 Toolbar
Tools such as the paintbrush, eraser and clone stamp live here. Photoshop's shortcuts work here, too!



3 Preview
It often helps to work on images very close up, so this preview can help you to navigate your way around.

4 Adjustments
This panel enables you to make wholesale changes to your images. You'll use it a lot!

Affinity Photo becoming a one-stop-shop: get an image looking how you want it to with a few quick clicks, then use the app's more powerful tools to remove elements, add objects from other images, touch up individual areas of a shot and, finally, export your finished work in a multitude of different formats.

Layering it up

Affinity Photo's big improvement over apps such as Lightroom and Apple's Photos is its ability to work with layers. Layers are just as they sound: sheets of extra pixels that can be overlaid or blended with the layers beneath them. You might use a layer to superimpose text, or to add a component to the image below. For example, you might want to pop a human figure on to a landscape, or drop a car onto a photograph of a sweeping road. Alternatively, you might cut out the sky from a landscape and add a more dramatic one from elsewhere.

Affinity Photo enables you to use thousands of layers to build up your compositions. As with Photoshop, whether these layers are preserved when you save your file will depend on which format you use. If you choose not to 'flatten' an image before saving it – that is, merge all its layers into one – you'll end up with a very large file size. You'll also need to convert to another format if you intend to print an image, too.

Adjustment layers will be familiar to anyone who's used Photoshop. They work in a similar way to standard layers in that they sit on top of your original image, but instead of containing new components, they change elements of the layer below. For example, you might use an adjustment layer to change the exposure or saturation of an image. You can change exposure or saturation on the original image itself, but an adjustment layer doesn't permanently affect the information it changes. This is known as non-destructive editing: no matter what you do to your original shot, you'll always be able to revert to its as-shot state.

Learning curve

If you're coming from Photos, Lightroom, or another one-hit-fix app, Affinity Photo, like Adobe Photoshop, seems like a fairly daunting task at first. Not only are the tools arranged in the toolbar somewhat abstract, but there are hundreds more options buried in the menu bar. Some of these tools, such as Levels and Curves, you'll use all the time, while others will see only the most occasional use in general photo editing, if you use them at all! Don't be put off, though: Affinity Photo's tools hide a vast amount of power and flexibility, and learning to use them will quickly yield some incredible results in sprucing up your photos.



Jargon Buster

A **per-pixel editor** is one that allows you to move and edit individual pixels, unlike Lightroom or Apple's Photos app.

Genius Tip!

Most of Photoshop's keyboard shortcuts work in Affinity Photo too, so moving over from Adobe's software should be a relatively smooth transition.



Jargon Buster

Lossless images, such as those saved in Affinity Photo's native format, don't throw away any information when they are saved, preserving their quality.

It's a little non-obvious that Affinity Photo provides five personas, each designed to help you with specific jobs. Of these, the default is Photo, which is the closest to Photoshop. Liquify enables you to pull pixels around, while the Develop persona is akin to Photoshop's Camera Raw plug-in, and the perfect place to start, particularly if you're dealing with RAW files straight from your camera, enabling you to correct things like exposure or sharpness before beginning more advanced work.

The Export persona lets you generate finished versions of your files. It's worth pointing out that the app can open Photoshop's PSD files, including their layers, as well as offering its own format. Your final format for most images will be JPEGs – small, high-quality files used by most commercial photo printers. If you're working on images with lots of layers, it makes sense to use Affinity's own format, which will not only preserve those layers but is also lossless, meaning the image quality is not degraded. You should only create JPEG files when you're sure you've finished working on a picture, and even then, storing a high-quality backup is a great idea.

A recent, free update to Affinity Photo added a fifth persona, Panorama, but you won't find that up in the top-left corner of the app's window with the others. Instead, it's activated when you're stitching multiple pictures together in a panorama. **Dave Stevenson**

HOW TO Make edits in the Develop persona



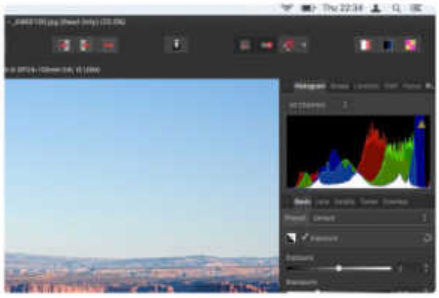
1 Import a file

Before you can switch between Affinity Photo's personas, you need to open a file. We've opted for a RAW file generated by a Canon DSLR here, although you will almost certainly find other cameras are supported, too.



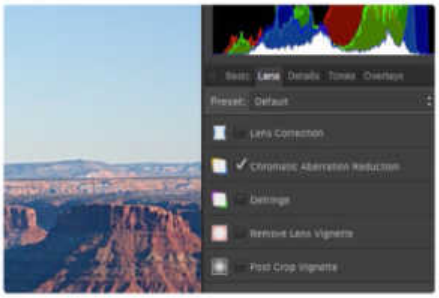
2 Develop a persona

Choose the Develop persona from the top-left corner. This adds commonly used options to the left-hand toolbar. The basics of this image – composition and exposure – are already pretty good, but there are other sliders to use, too.



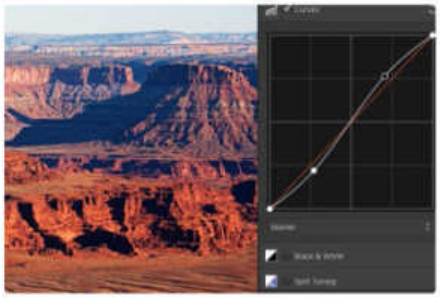
3 First edits

Scroll down the list of options and you'll find a few basic colour-correction features. We'll add a small amount of contrast, a decent thwack of clarity, and then some saturation. These options add punch and contrast to our picture.



4 Fix purple fringing

Click the Lens tab above the basic tools. Lens correction allows you to fix things such as barrel distortion. Switching on chromatic aberration reduction will repair purple fringing on the edges of high-contrast areas of your image.



5 Tone curves

Finally, choose the Tones tab and check curves. Changing the tone curve of an image changes how dark shadows are and how bright highlights are. Clicking the tone curve and shaping it into an 'S' will generally add a bit of drama.



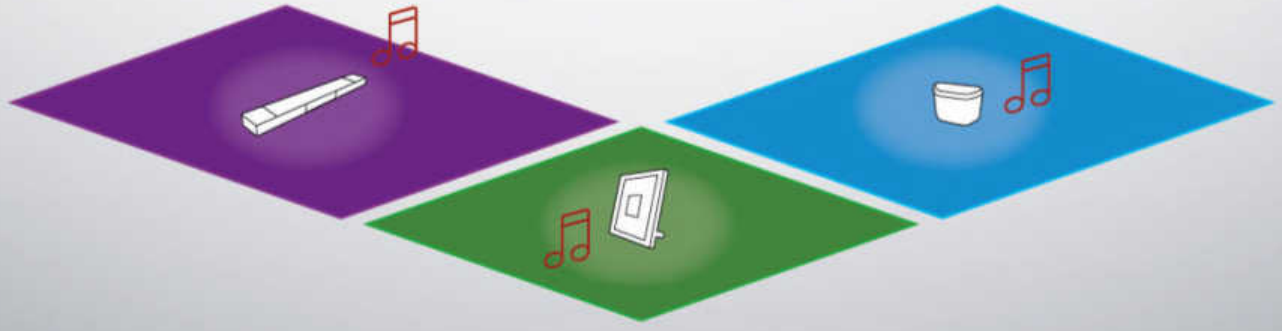
6 Final fixes

Changing the tone curve has darkened the image, so return to the Basic tool panel and add a third of a stop of exposure. Voila! At the top-left corner of the app, click the blue Develop button and your changes will be written.

YAMAHA

MusicCast

Wireless Music System



The new Network Audio System from Yamaha, take control of your music and audio.

A new world of wireless freedom.



MusicCast Controller App

Control all your music and devices from everywhere in your home using one simple app. Link rooms together and share any content you like or connect Bluetooth devices as you wish. Yamaha MusicCast is designed to fit with your lifestyle and needs, with unlimited potential in the palm of your hand.

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For more info visit **yamaha.com/musiccast**

Secure your Mac with MacID

Discover this versatile Mac and iOS app for keeping out prying eyes

IT WILL TAKE
› 10 minutes

YOU WILL LEARN
› How to pair your iPhone with your Mac.
How to automatically lock and unlock your Mac using Touch ID.
How to unlock your Mac with a custom tap.

YOU'LL NEED
› OS X 10.10 or higher.
iOS 8 or higher.
Bluetooth 4.0 in both devices.
Touch ID.

MacID provides a convenient way to lock or unlock multiple Macs

Not everyone uses password protection to lock their Mac, but everyone should. With so many sensitive details like passwords and bank accounts accessed online, the last thing you want is anyone peeking at your private data. The only bugbear about locking and unlocking your Mac repeatedly, especially away from home, is that you end up typing your password over and over again. Apple's newer iPhones and some iPads have Touch ID, a fingerprint scanner that you can use to unlock the device and authorise actions, such as Apple Pay. MacID is a clever app that harnesses the power of Touch ID to streamline the process of securing your Mac in a way that makes unlocking the screen much simpler.

Customise your login

It does this by pairing over Bluetooth and then giving you the option of remotely locking or unlocking the Mac's screen from your iPhone, iPad or even Apple Watch. Even more usefully, it can be set up to trigger automatically in certain situations. You can, for example, make it lock the screen as soon as you move away from your Mac, with distance being configurable in the app's settings. It can also wake the Mac up when you come back towards it, again with a setting for what distance will trigger this action. Another clever option is the ability to tap out a unique pattern on a Mac's trackpad in order to unlock it. This is handy if you don't have your iOS device with you, and tapping a pattern takes only a second or so. Read the boxout on the opposite page to find out how to make the most of the 'tap to unlock' feature.

MacID can do other useful things, such as control iTunes or Spotify playback or copy the contents of a clipboard between devices, which is something Apple should really bake into its operating systems.

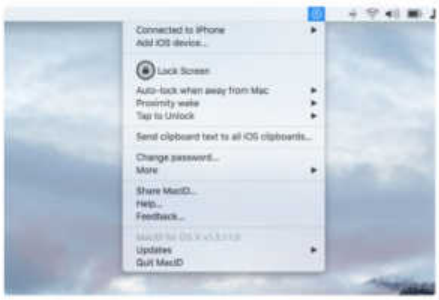
If you own an Apple Watch, MacID provides you with a convenient way to lock or unlock multiple Macs or start screensavers from your wrist. You can add MacID's Glance to the Watch to easily see how many Macs you are connected to, which could be handy if you manage a number of computers at home or in an office. You'll need a Mac and an iOS device with support for Bluetooth LE, which includes iOS devices as old as the iPhone 4S and MacBooks from 2011, so it's likely that if your kit is recent you will be able to run MacID without problems. **Hollin Jones**

HOW TO Pair your Mac and iPhone ›



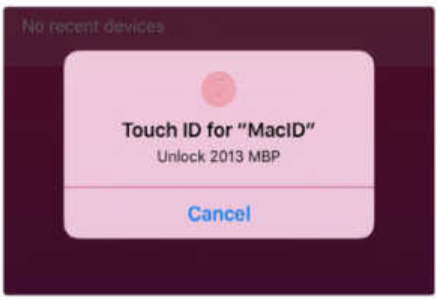
1 Download the Mac app

Go to macid.co and download MacID for Mac, as well as MacID for your iPhone (£2.99, App Store), which includes a Glance for Apple Watch. Open the Mac app and choose 'Add iOS Device'. Both devices need Bluetooth turned on.



2 Pair the devices

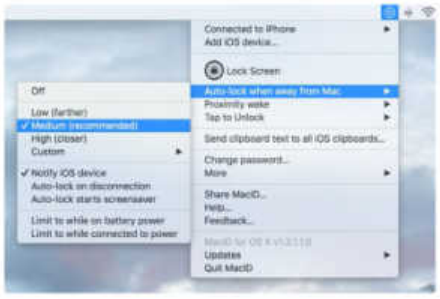
Open the iOS app and the two devices should see each other. The Mac helper app will ask for your user account password and then store it securely. Once paired, the app appears among the icons on the menu bar's right-hand side.



3 Lock from iPhone

In the iOS app, tap the Mac's name to lock the Mac's screen. Tap again to unlock it; this time you will need to place your finger on the Touch ID sensor to authorise the unlock. You need to have set up Touch ID already for this to work.

HOW TO Use MacID's proximity features ›



1 Auto-lock your Mac

In MacID's menu, choose 'Auto-lock when away from Mac'. Then, from that submenu, select a distance that will trigger locking: 'medium' is a good starting point. Now when you walk far enough away, the Mac will lock itself.



2 Auto-unlock your Mac

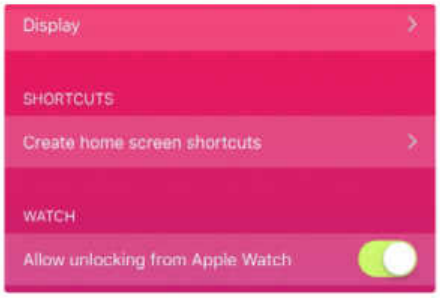
In the Proximity Wake menu, select Unlock Automatically if you want to have your device unlock the Mac as soon as you come within range. The combination of these two distance-based settings automates access to your Mac.



3 Wake by proximity

From the Proximity Wake menu, switch on the eponymous feature. Under Custom you can set a specific distance at which the Mac will wake up, based on Bluetooth signal strength. Experiment to tweak this distance to your needs.

HOW TO Control your Mac using your Apple Watch ›



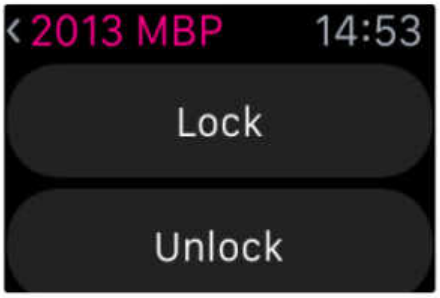
1 Activate the Watch app

Installing MacID's iPhone app makes its companion app available on your Apple Watch. In MacID on your iPhone, go to the Settings section and make sure the option to allow unlocking from Apple Watch is switched on.



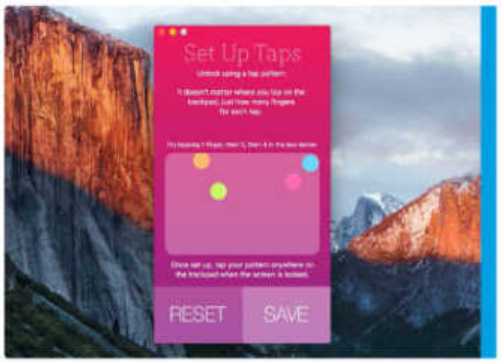
2 Lock from your Watch

Since the Watch shares the iPhone's Bluetooth connection, it can talk to the Mac via the phone. In the Watch app, tap the computer's icon to lock the Mac's screen. You also have music playback controls for iTunes or Spotify here.



3 Unlock from your Watch

Swipe left in the Watch app to reveal the shortcut menu. Here are buttons to lock or unlock your Mac, to start its screensaver, and also to disconnect the Watch from the Mac. The Watch remains authorised as long as you're wearing it.



Tap to unlock with your trackpad

Another way to securely unlock your Mac ›

From the Mac app's menu, choose Tap To Unlock › Setup. Put the pointer over the box in the window that appears, then enter a pattern by tapping several times, potentially with more than one finger per tap if you like. The app will remember the pattern and add it to the list of methods that will unlock your Mac. It's probably not quite as convenient for you as proximity unlocking, but it's still faster than manually typing a password (you'll see the password fill in when the correct taps are pressed). It's also very handy if you don't have your iPhone with you.

Sign in with iCloud Keychain

Make your online life easier to manage across all of your Apple devices

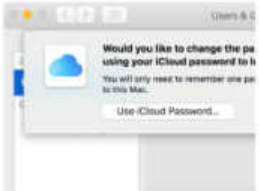
IT WILL TAKE
› 20 minutes

YOU WILL LEARN
› How to keep your website credentials and, optionally, bank card details up to date across all your devices.

YOU'LL NEED
› OS X 10.9 or higher. iOS 7.0.3 or higher.

Genius Tip!

› When setting up a new Mac running Yosemite or El Capitan, your iCloud password is, by default, also used to sign in to your user account. You can set this up retrospectively in System Preferences. Open the Users & Groups pane, select your account and click the Change Password button, then select Use iCloud Password in the dialog that appears.





Passwords, bank card numbers, email account settings... living in the modern world requires us to memorise more obscure information than ever before. No wonder so many of us pick a single, easy-to-remember password and use it across every service, from webmail to stores to online banks.

While that might make life easier for us, it certainly doesn't make it secure, as a breach of any one of those systems leaves every site you ever sign in to – as well as your Mac – potentially vulnerable.

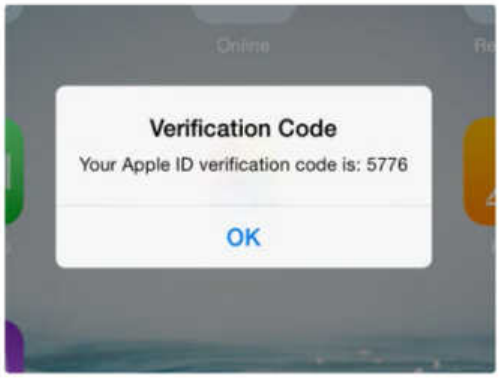
Fortunately, iCloud Keychain can help. This feature, which is built in to OS X and iOS, syncs your account credentials between each of your Apple devices, so you can set obscure, less memorable passwords that are unique to every website you use, and then forget about having to remember them yourself. Safari is even able to fill in the details on your behalf. iCloud Keychain can even store your bank card details and the credentials for your email accounts and Wi-Fi networks, making those available on all your devices, too. Turning it on automatically moves details you've already saved to your Mac or iOS device to iCloud, and any new additions or amendments you make are added to the online keychain over time.

All in sync

Your details are encrypted before being passed through Apple's data centre on their journey between your devices, so even if they're intercepted in transit they should be uncrackable. How can we be so sure? Because



Keep your Recovery Key safe: you'll need to use it to unlock your account if you forget your password.



Apple will send a four-digit code to any device you want it to trust when administering your account.

Apple's opted for the strongest variant of the same cypher used by the US government for secure communications (called 256-bit AES encryption), and further scrambles the data in transit using a complex piece of algebra, based not on numbers but on imaginary points located on a theoretical shape – an elliptic curve – drawn within an infinite space!

As a final level of protection, iCloud only shares your synced keychain with Apple devices that you've explicitly authorised to access the keychain's contents – so-called trusted devices – and it doesn't store the security code from the back of your bank card, effectively building in a firebreak against anyone making unauthorised purchases.

Once you've set up iCloud Keychain, you can largely forget about it, provided you keep three essential elements secure: your password, your trusted devices, and the Recovery Key for your iCloud account. The latter of these is used to reset your account's password if you forget it after setting up two-step verification, in which Apple will send a passcode to your iPhone that you'll need to enter at appleid.apple.com to prove that you have that particular trusted device.

Losing any two of these three parts of the system at once will lock you out of your account – perhaps permanently! If you can't memorise your password and Recovery Key, consider storing them in a fireproof safe along with any important legal documents, passports and so on, that you need to protect.

Nik Rawlinson

HOW TO Get the most from iCloud Keychain ›



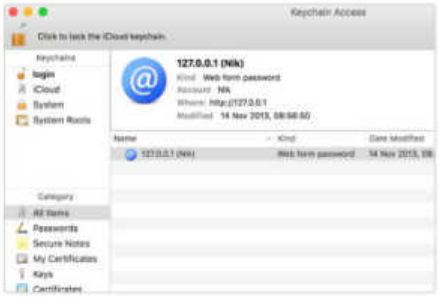
1 Turn on iCloud Keychain

OS X will have asked if you want to set up iCloud Keychain during initial setup of your Mac. If you said no, open the iCloud pane in System Preferences and select Keychain. Enter your Apple ID's password when you're prompted for it.



2 Add a security code

You'll be asked to set a security code, which is used to authorise other devices to access the information in your iCloud Keychain. Entering it wrong too many times will wipe your keychain from Apple's servers, so be wary of that!



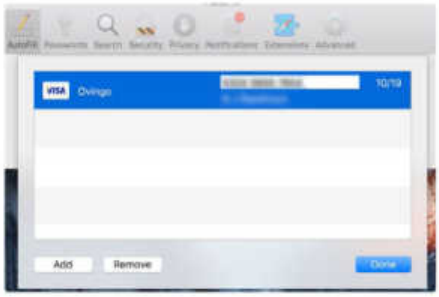
3 Where's your data?

Your existing data (site accounts, Wi-Fi networks, and internet accounts) is copied to iCloud and, from there, to other devices using the same iCloud account. Manage it in the Keychain Access app, or under Passwords in Safari's preferences.



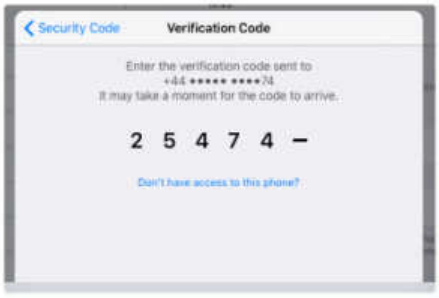
4 Keep Keychain local

If you opt not to set a security code, data you add to your keychain is stored on your device, and it's updated on your other devices, but it isn't stored in iCloud. Beware that this prevents Apple helping you recover the keychain's contents.



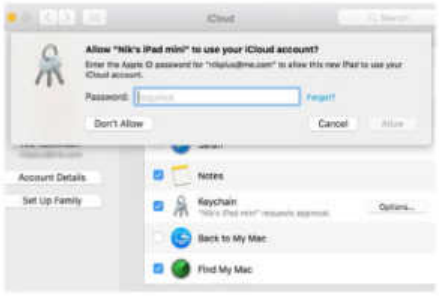
5 Add bank card details

Safari offers to save credit and debit card numbers when they're entered into online forms. They're then stored in your iCloud Keychain, too. To add others, open Safari's preferences, click AutoFill, then Edit beside Credit Cards, and then Add.



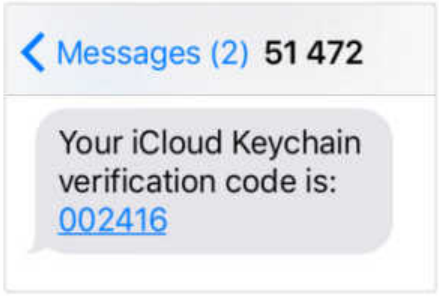
6 Set up Keychain on iOS

Go to Settings › iCloud › Keychain and tap the switch to turn it on. Enter your Apple ID password when prompted, then opt to authorise from another device (so, your authorised Mac), or tap Approve with Security Code.



7 Permit the new device

If you opted to authorise from another device, notifications will pop up on those you've already authorised – click or tap one. Next, click Continue and enter your Apple ID's password to grant the iOS device access to your keychain.



8 Maintain security code

If you opted to use a security code, confirm the phone number Apple has on its records of you, then watch for a text message containing a six-digit code. Enter this code into the dialog on the iOS device to complete the process.



9 Remove your Keychain

To clear your keychain data from iCloud, go to System Preferences' iCloud pane, click Options next to Keychain, then clear the box next to 'Allow approving with security code'. Finally, on each of your devices, turn off iCloud Keychain.

THE ULTIMATE OS X EL CAPITAN HANDBOOK



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› Make even more of your iPad, iPhone and Apple Watch with these in-depth guides, all written by the experts at MacFormat. Buy them online today for £12.99 each.







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Make art on your iPhone

Unleash your creative side by using 3D Touch to vary your brush strokes

IT WILL TAKE
30 minutes

YOU WILL LEARN
How to create art on iPhone 6s with apps that use 3D Touch to measure how firmly you are pressing on the screen.

YOU'LL NEED
iPhone 6s.
Canvas.

3D Touch's sensitivity makes a good substitute for real painting

One of the marquee features of the iPad Pro is the Apple Pencil, a pressure-sensitive drawing tool that measures how firmly you are pressing on the screen. The iPhone doesn't support Apple Pencil, but the latest models – the 6s and 6s Plus – are equipped with a 3D Touch display that's also able to detect the pressure you apply to the screen and relay that information to software.

Apple designed 3D Touch to allow new gestures, but clever developers have taken advantage of the pressure sensitivity to create apps that use 3D Touch in novel ways. Canvas (Free, https://appsto.re/i6S57ZS) is one such app. In some ways it's like many other drawing apps: you sketch on the screen using your finger or a stylus and the app recreates the effect of brush strokes. What makes this app special is that it uses 3D Touch to measure how firmly you are pressing on the screen, and it responds accordingly: firmer pushes produce thicker, more defined brush strokes.

3D Touch does not offer all the features of an Apple Pencil; you can't use the side of a stylus to shade in your drawings, for example. However, we feel it is a better experience than painting without pressure-sensitive response.

Canvas is a fantastic way to create drawings when you don't have more capable tools to hand, and 3D Touch offers an extra level of interaction that makes it more believable as a digital replacement for paint and a canvas. Setting up the app to make use of 3D Touch is remarkably easy because you don't actually need to do anything – you can just open the app and start painting, pushing gently for a light stroke or more deeply for a dark one. Canvas includes four brushes as standard. A £2.29 in-app purchase unlocks five more brushes and the ability to paint on up to 10 layers.

Colour schemes

Canvas has a comprehensive colour picker that provides you with the ability to pick out schemes, such as analogous, triad and complementary groups of colours. The picker makes it easy to find colours that work well together. Tap the Themes option and you'll find dozens of premade colour schemes.

You can also adjust the size and opacity of your brushes, and your creations can be exported as layered Photoshop files, or as flat PNG or JPG files. You can even record video of your work as you draw. **Lucy Hattersley**

HOW TO Draw with Canvas



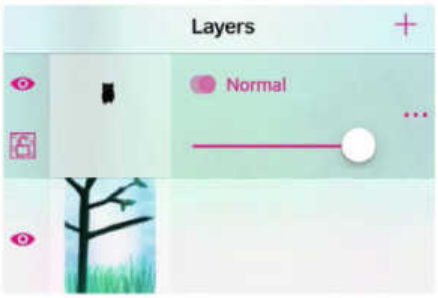
1 Get ready

Tap the + icon to create a new project. Each starts with five blank canvases: tap one to get started. Tap the black circle, then drag the small circle in the colour wheel to pick a colour. Tap the icon at the top-right of the wheel to pick a scheme.



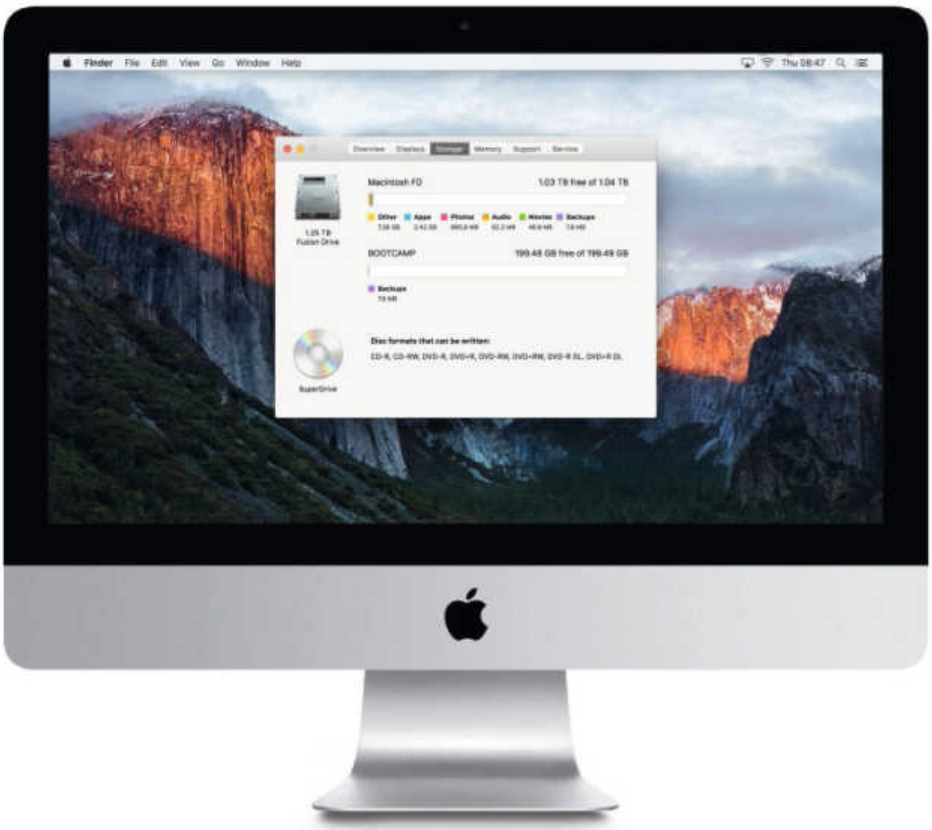
2 Start to sketch

Tap the paintbrush icon to choose from the app's selection of nine brushes. Now drag your finger on the canvas to paint a stroke. Press more firmly for thicker strokes. The sliders at the bottom of the screen adjust width and opacity.



3 Layer it up

As you create more complex images, add layers on which to paint by tapping the rightmost of the four tool icons, then tap + to add another layer. You can lock, hide and adjust the opacity of layers, much like in Photoshop and similar apps.



Make your own Fusion Drive

Boost your Mac's responsiveness without compromising on disk capacity

IT WILL TAKE
› At least 2 hours

YOU WILL LEARN
› How to use tech that is built in to OS X to create a Fusion Drive using your hard drive and an external SSD.

YOU'LL NEED
› OS X 10.8.2 or higher.
2.5-inch SSD.
USB 3.0 drive enclosure.

We'll show you how to make your own Fusion Drive for just £77

Apple's Fusion Drive technology is intended to bring the benefit of fast flash storage to desktop Macs in an economical way, and without compromising on the large storage capacity you would expect to be built into such a computer. Even now, more than three years since Fusion Drive's introduction, flash storage is disproportionately expensive per gigabyte compared to traditional hard drives. On the few iMacs on which Apple offers 1TB of its ultrafast PCIe storage as an option, that will add £720 to your bill. In constrast, upgrading from the regular 1TB hard drive to a 1TB Fusion Drive can cost you as little as £80 extra.

If you've bought a desktop Mac in the last three years or so, you might have decided you could get by without a Fusion Drive to save yourself even comparatively modest extra expense. Your Mac may now be looking a little long in the tooth – particularly compared to modern MacBooks, all of which have flash storage – simply because you're having to wait for mechanical storage media to catch up with what you're asking the computer to do. Apple doesn't offer post-sales Fusion Drive upgrades. However, the USB 3.0 ports on recent Macs provide a cost-effective way to create your own Fusion Drive.

If you have enough spare cash to throw at upgrading your current Mac, you could just buy a 1TB solid-state drive to connect externally and run your computer from that. Although a 1TB bare SSD will cost you far less than what Apple charges for flash storage, it's still more than £200. So, we'll look at the more affordable option of making a home-made Fusion Drive for well under half that amount.

How does Fusion Drive work?

Fusion Drive is really just a friendly name for a technology called Core Storage – specifically, it's a Core Storage Logical Volume Group – which is available in OS X 10.8.2 or higher. As long as you're brave enough to enter a few commands in Terminal, you can 'fuse' your Mac's internal hard drive and an external SSD together so that their capacities are combined



The two parts of your Fusion Drive will show up as a single drive in Disk Utility, but you can verify your setup in Terminal.

into what looks like one drive. The idea is that if you weren't aware of this going on behind the scenes, you would perceive it as a single drive that's both fast and capacious.

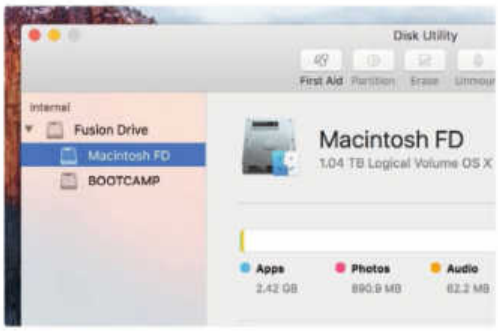
Behind the scenes, OS X is smart enough to recognise that one of the parts of a Fusion Drive is much faster than the other. Whenever new information needs to be written to a Fusion Drive, it's written to the faster storage as a matter of priority. This makes your Mac feel better to use than one that's equipped only with a plain old hard drive, even though that still makes up a large part of its storage.

When free flash storage falls to a certain amount – we're talking a few gigabytes – OS X uses its long-term assessment of what you use most often, whether that's your own files or apps, to determine what it can relegate to the hard drive without affecting you much, if at all. (OS X remains on flash storage to aid its performance.) A minimum amount of free space is maintained on the flash storage so that the operating system always has space to store information in a hurry.

If you use something from the hard drive enough, OS X will recognise that and move something else to the slower storage, and move the information you're actually using a lot back to the faster storage medium. For efficiency, OS X doesn't necessarily move entire files between a Fusion Drive's two parts. Instead, it works at a lower level to move only what is necessary.

Sensible precautions

Before we get down to work, back up all of your hard drive's current contents. Setting up a Fusion Drive requires temporarily erasing it, so save yourself unnecessary hassle by making a complete backup of it. You'll be able to restore this to the Fusion Drive later. Time Machine is the simplest way to do this, of course. In its preferences, ensure no system folders or others containing important personal files are excluded from its backups. Next, click Time Machine's status icon in the menu bar – turn this on in its preferences if



You can set up a Fusion Drive without affecting Boot Camp, but it's sensible to back up both OS X and Windows anyway.

Jargon Buster

Fusion Drive uses Apple's **Core Storage** technology to pool two physical disks together. One disk failing will affect the whole drive, so it's as important as ever to back up.

Genius Tip!

If you have a 2011 iMac, you can use a Thunderbolt enclosure in place of a USB 3.0 one. However, they are a lot more costly.

EXPLAINED... The hardware you'll need

1
8GB USB flash drive
Ideally, use a drive of this exact capacity, as this is all you need to make an OS X install disk.

2
2.5-inch SSD
Apple's Fusion Drives contain either 24GB or 128GB of flash storage; a 250GB SSD costs little extra.

3
USB 3.0 hard drive enclosure
You'll need a drive enclosure to store the SSD, and to connect it to your Mac.

4
A Mac with USB 3.0 ports
USB 2.0's slower transfer rates will negate the point of building a Fusion Drive.



Jargon Buster
A **Logical Volume Group** is the glue that binds a Fusion Drive's parts together. A **Logical Volume** is then created across all drives in the group.

Genius Tip!
On OS X 10.10.4 or higher, consider turning on TRIM (bit.ly/trimforce) by entering `sudo trimforce enable` in Terminal.

you don't see it – and choose the Back Up Now option. While that process takes place, you can prepare some other essentials.

The image above shows the three things you need. If you already have a spare 8GB USB flash drive, you'll only need to buy an SSD and an enclosure to put it in (our recommended model to the right even includes a USB cable). The USB flash drive – that's the thumb drive, not the SSD – only needs to be 8GB as that's all that's required to store the OS X installer.

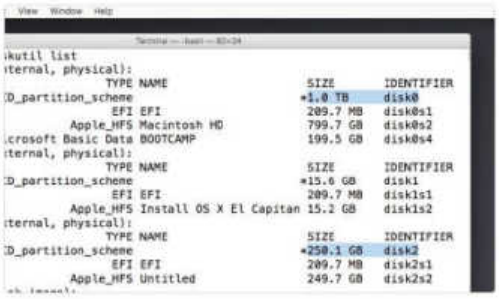
Originally, Apple's Fusion Drives included 128GB of flash storage (recently reduced to 24GB on 1TB models). However, the difference in price between a 120GB and a 250GB SSD is only about £14 or so. Doubling up means more information can be kept on the faster storage medium at any one time, delaying the need for OS X to shift data to the hard drive at all.

Lay the groundwork
Disconnect all other external storage from your Mac so you don't accidentally erase an incorrect drive at any point during this process. Now, connect the USB flash drive to your Mac and ensure it doesn't contain anything you want to keep. Open Disk Utility, select the flash drive – not the partition on it – and then click the Erase button on the toolbar. Give it a format of OS X Extended (Journaled), and set its partition map type to GUID so your Mac can start up from it.

Download the installer for your version of OS X from the Mac App Store. It needs to be OS X 10.8.2 or higher. When it's downloaded, use it to create an OS X install disk. For OS X 10.9 or higher, follow Apple's instructions at http://bit.ly/osxinstalldisk. For OS X 10.8 (Mountain Lion), hold ctrl and click the installer, choose Show Package Contents, browse to Contents/SharedSupport and double-click InstallESD.dmg there. Open Disk Utility, click the Restore tab, drag 'Mac OS X Install ESD' from the left pane into the Source box, and the partition on the USB flash drive into the Destination box. Click the Restore button and, if asked for them, enter your account credentials. It takes a while for the OS X installer to be copied to the flash drive.

With your OS X install disk prepared, restart your Mac and hold down ⌥ from the moment you hear the startup sound until you see a list of partitions that your Mac can start up from. Among them, you should see the install disk you just created. Use the arrow keys to select it, press ↵ and then wait for a while. You'll eventually reach a menu with four major options. Ignore that and choose Utilities > Terminal instead. We're now ready to build your Fusion Drive. **Alan Stonebridge**

HOW TO Set up your Fusion Drive

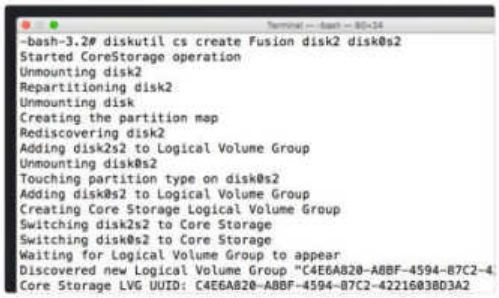


1 Gather some information

In Terminal, type `diskutil list` and press ⏎ to list partitions, which are grouped by disk under rows starting /dev/diskX (where X is a number). Two rows below those ones, use the Size column to work out which disk identifiers refer to your internal hard drive and your SSD.

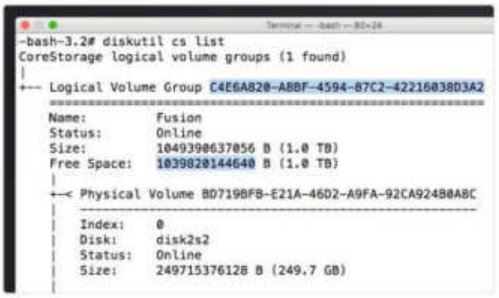
2 Protect other partitions

To avoid wiping the partition that contains the Recovery system and, if it exists, one for Boot Camp as well, examine the output for a row that lists the name of the partition that contains OS X. Note its identifier to the right, which will be in the format diskXsY.



3 Prep a logical volume group

Type `diskutil cs create Fusion` followed by a space, then the identifier of your SSD, another space, and then the identifier of your OS X volume. Press ⏎ to create a logical volume group that identifies the storage that will be used by the Fusion Drive.



4 Gather more information

Next, type `diskutil cs list` and press ⏎ for a summary of what was created. In the row that starts '+-- Logical Volume Group', drag the pointer through the long alphanumeric code to select it, then press ⌘+C. Make a note of the free space listed five lines below that one.



5 Prepare a volume

Type `diskutil cs createVolume`, a space, then press ⌘+V to paste the code you copied. Type another space, then `jhfs+ "Macintosh FD"` and a space. Divide the capacity you noted by 1,000 three times and type the result (we've done so to three decimal places) – and then *g*.



6 Finish up and restore data

Press ⏎ to make the volume. When done, look for a line that says 'Finished CoreStorage operation'. Quit Terminal. Your Fusion Drive, named Macintosh FD (or whatever you want to rename it), is waiting for you to install a fresh copy of OS X or restore your backup to it.

Best Buys!

This is the hardware we used to create our own Fusion Drive. You might be able to save a few extra pounds on the SSD's price by picking a different brand or capacity, but our pick is a good deal overall.



SanDisk Cruzer Fit

Any USB 2.0 or 3.0 flash drive can be used to create an OS X install disc. Its capacity only needs to be 8GB; this one costs less than £4.



Samsung 850 Evo

The 250GB version of this drive sells for just £60. That's almost double the flash storage capacity used in Apple's largest Fusion Drives!



StarTech S2510BPU33

This USB 3.0 enclosure is plastic, yet requires no tools to open and fit an SSD. For £13, it includes a USB cable.

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GENIUS TIPS

EDITED BY **HOWARD OAKLEY**



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What to do when you think your App Store apps become damaged

Q **Three apps I bought from the Mac App Store will no longer open, as they are reported as being damaged. Two reinstalled fine, but the third no longer supports my version of OS X, and cannot be reinstalled. How were they damaged, when others were not?**

by JOHN BROWN

A The awful truth is that there was probably nothing wrong with them. When you start an app bought from the App Store, it checks an Apple security certificate. Late last year the certificate expired, and a new one replaced it. However Apple changed the type of hash key used to check it, and some apps could not cope with that. Sporadic problems continued, but should have settled down by now.

The problem with that alert is that it is incorrect, as the apps were not damaged in any way. But if you ignore it, you cannot run them. If you trash the apps and reinstall them, as it recommends, then you risk losing access to those which can no longer run on older versions of OS X.

Restoring a copy of the app from your backup will not help either, as that will not work with the new certificate, and you will see the same alert if you try to run it. All you can do is contact Mac App Store Support (http://apple.co/1Ors3yk) and press for a refund.

Mac OS X

Shine a spotlight on sagacious solutions to your most maddening Mac maladies

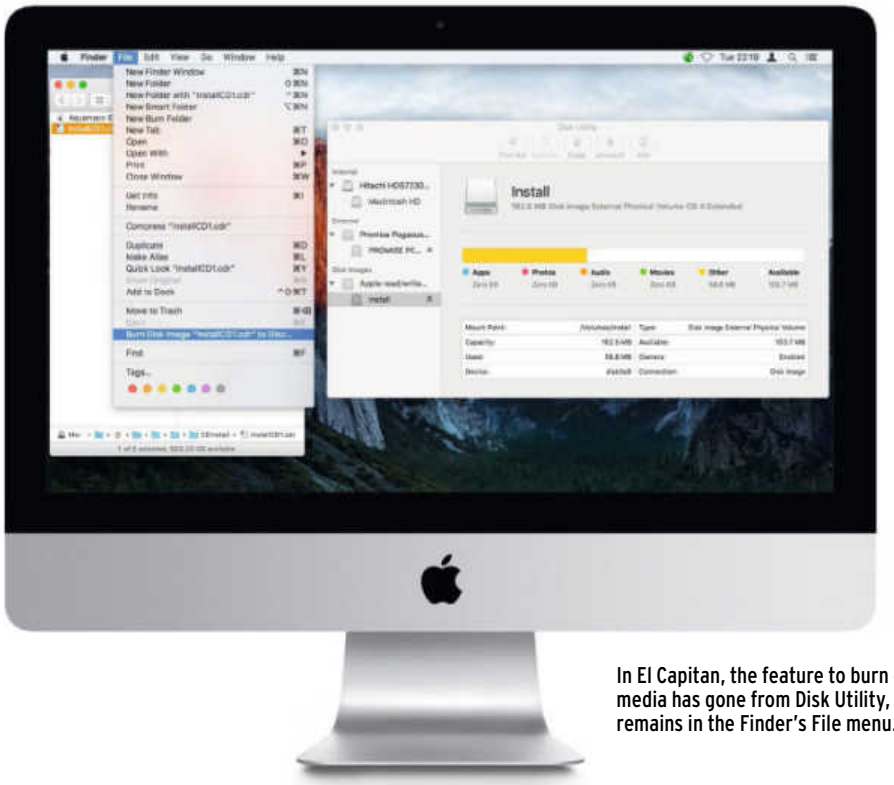
OS X quick-fire questions

Can I turn off System Integrity Protection so that I can change some of my system files?

Yes, but Apple really does not want you to do that, as it could compromise your Mac's security. You will have to restart in the Recovery system (⌘+R at the startup sound), choose Utilities > Terminal and enter `csrutil disable`. Remember to return there and re-enable it using `csrutil enable`.

How can I tell which types of optical media my Mac supports?

When using an external drive, check the manufacturer's documentation to find out the types of media it supports. You can find out the supported types for an internal drive provided by Apple by choosing About This Mac from the Apple menu, then clicking the Storage tab in the window that opens for a complete listing of those it can write to – which it can read too, of course.



In El Capitan, the feature to burn optical media has gone from Disk Utility, but it remains in the Finder's File menu.

Disk Utility no longer burns DVDs, nor repairs permissions

Q **After I had upgraded to El Capitan, I discovered that it has dropped Disk Utility's ability to create and burn DVDs. I used to burn about five DVDs a week using Disk Utility. It has also lost the ability to check or repair permissions. How can I do these things now?**

by BARRY VARGAS

A Disk Utility can no longer burn disk images to optical media, but Finder can. Create a disk image as you did before using Disk Utility (instructions are at http://apple.co/1QGPvfG). Once done, hold ctrl, click the image file, and then choose 'Burn Image [filename] to disc'.

Repairing permissions is a bit more complex. In earlier versions of OS X, it was common for system files and folders to have their permissions damaged, usually during software installs and updates, and it was valuable to be able to check and repair them. This became perceived as a panacea for all sorts of other problems too. In El Capitan, Apple has protected those files more robustly using System Integrity Protection (SIP), and their permissions cannot go awry.

Permissions are now checked when you start up or restart your Mac. Due to SIP, you can no longer run an ordinary utility which can either check or repair the most important permissions in El Capitan.

El Capitan's new system font sadly isn't for use in documents

Q I really love the new system font in El Capitan. I have tried to find it in font selection dialogs in various apps, so that I can use it in my own documents, but cannot see it anywhere. Am I missing something?

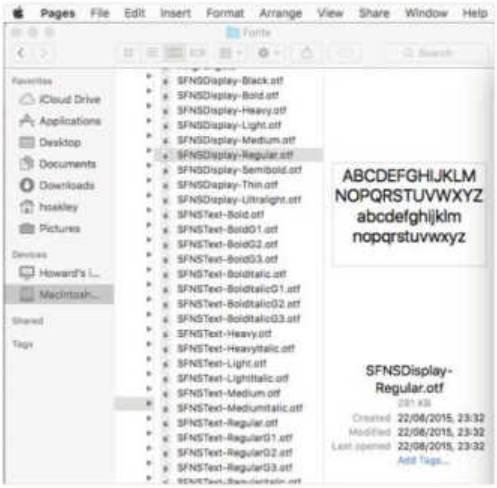
by COLIN PRIOR

A El Capitan's new San Francisco font is one of the first to be designed specifically for use on modern, high-resolution displays. It's also the system font in iOS 9 and watchOS 2. However, Apple stresses that this is not a general-purpose font and has not been designed for use in printed documents. It is actually only licensed for use as the system font, and using it elsewhere would be a breach of that licence.

There is also a bigger and more practical problem: the only systems which can use San Francisco are devices running one of those operating systems. No font foundry or vendor can offer it for others. So, if you used it in documents, almost everyone viewing them would have to substitute another font for it.

Apple has cunningly hidden San Francisco from normal font dialogs by giving it a name starting with a period, a trick to make it clandestine. You will find the San Francisco font in /System/Library/Fonts, in several files with names such as SFNSText-Regular.otf. Perhaps that makes it all the more frustrating!

> Using San Francisco as anything other than El Capitan's system font would breach its licence



If El Capitan's system font looks too thin, you cannot make it bolder – but Finder can be set to use it at a larger size.

Can you make El Capitan's screen font blacker for ease of reading?

Q My eyesight with glasses is still reasonably good, but now that I have upgraded to El Capitan I find that I am having trouble reading its new system font. Is there any way to make its characters a bit blacker? I have tried the Increase Contrast setting in the Accessibility pane, but that did not do the trick for me.

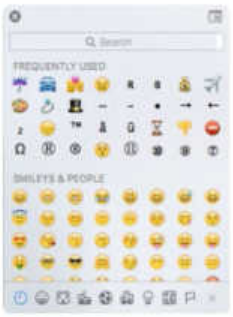
by CLAIRE RUSSELL

A There is no easy way to fix this, as you cannot currently change the weight of the system font, for example, to make it heavier. You can alter the size used, say to 13 or 14 point, by choosing Show View Options in the Finder's View menu and setting your choices as new defaults. However, that only affects Finder windows, and there is no option to use a heavier weight.

If you continue to find San Francisco a struggle to read, you could revert to the previous system font, Lucida Grande, using the free Automator app from http://bit.ly/lucidaelcap. As that comes without a secure signature, in order to run it you will have to hold ctrl and click it in Finder and then choose Open in the contextual menu to get it past Gatekeeper's security check.

How can I find the pointer easily on my 27-inch iMac?

Open the Accessibility pane and select Display on the left. On that page is an option to shake the pointer to locate it; ensure it is checked. When you next lose the pointer, just give it a shake and it will temporarily enlarge.



How can I use new emojis on my Mac?

Some apps offer an Emoji & Symbols command in their Edit menu. Otherwise, go to System Preferences > Keyboard and select 'Show Keyboard, Emoji & Symbol Viewers in menu bar'. Click the new icon in the bar and use the Emoji Viewer to insert the one you want.

I am struggling to distinguish emojis Is there a way to enlarge them?

Emojis which are embedded in regular text are displayed at the same font size as the surrounding text. The only way to make those emojis larger in most apps is to increase the font size in the app's preferences to make them clearer – changing surrounding text too.

Peripherals ›

Untangle your FireWire cables from your Thunderbolt with our help for external devices

Peripherals quick-fire questions ›

Does Final Cut Pro X support direct import of video from digital cameras?

› Yes, but only from certain models. Apple provides a list at http://bit.ly/fcpxcameras. In general, you will find it simplest to use a camera which records to solid-state memory in MPEG-4 or H.264 format, although AVCHD and some digital tape formats are also supported.

My video camera has a FireWire port, but my Mac only has Thunderbolt. Can I use an adaptor?

› Yes: you will need a FireWire to Thunderbolt adaptor (Apple's costs about £25) to connect between the camera and your Mac. That has a FireWire 800 port, yet FireWire 400 connectors are more common on cameras so you may need to add an adaptor for that into the mix.

Hooking up an analogue video camcorder needs more than just a cable



Elgato's Video Capture kit consists of a video digitiser which converts analogue input signals to digital form, and software to import and edit it.

Q I have a Canon Hi8 camcorder and a bunch of old videos recorded with it. How can I connect the camcorder to my iMac to access and edit my videos?

by TONY SHERRINGTON

A Your camcorder can only deliver analogue video through its S-video port. For your iMac to be able to read from it, that analogue signal first needs to be converted into digital form. Such conversion used to require chunky external boxes, or expensive internal boards, but can now be performed by much smaller, inexpensive kit.

Once the video has been digitised, it must then be delivered to your iMac through a port that makes it accessible to video-editing software. The automatic choice used to be FireWire, but with few cameras now using that, and modern Macs preferring USB 2.0 or 3.0, the answer is less clear-cut these days.

Apple lists cameras supported by iMovie at http://bit.ly/imoviecams, but that app does not support this type of input from a digitiser. Your best solution is therefore an integral package of hardware and software, such as Elgato's Video Capture (£90), which is detailed at http://bit.ly/elgatovidcap.

If you only want to transfer a limited quantity of old movies, it often works out both cheaper and simpler to send your tapes off to a service bureau, which will digitise and return them on DVD. There are many bureaux around the country, including http://www.video-to-dvd.co.uk. They normally charge about £15 per tape to standard DVD-Video format, ready to play, or £30 to convert to QuickTime movies which you can then edit yourself.

How to use different location settings for your mouse's tracking speed and sensitivity



Most system preferences, other than Network, cannot be configured for different locations, but some should be controllable by using AppleScript.

Q I usually use my MacBook Pro with an external mouse and keyboard connected to a large display, but sometimes I use it without a display and with a different mouse and keyboard. I found that I wanted different pointer tracking speed and sensitivity for these situations. Because the standard Mouse preferences pane cannot control sensitivity, I use SteerMouse to support that. Is there any way to automate switching its settings according to location?

by DUNCAN BRACK

A SteerMouse (http://bit.ly/steermse) uses a substitute mouse driver, implemented as a kernel extension, to accomplish this. There are two ways to modify settings like these. The preferred route is to alter the file that stores SteerMouse's preferences. You could write a script to swap one version of that file for another when you move between locations. However, to make that swap take effect, you would have to log out and back in to force SteerMouse to read its settings again. That would involve more effort than manually changing the settings.

Alternatively, you may be able to script the change, using AppleScript, using a line such as:

```
tell application "System Events" to tell process "System Preferences" set value of slider 1 of window 1 to 5.0
```

That would produce an immediate switch, as if you had manually changed it in the pane. However, this does not always work, and may well not do so with SteerMouse. It would be so much easier if all settings were covered by a Location option, as network settings are.



I use Apple's Magic Trackpad and a wireless keyboard. Do I still need a mouse?

Keep a standard USB mouse and keyboard to hand, in case your Mac has problems starting up. You could then find the mouse and keyboard the only reliable way to control it, if your Mac cannot load its Bluetooth drivers.

My keyboard lacks an Enter key, and Return doesn't work properly in some apps. Do I need a new one?

No: hold fn and press ↵ to mimic the Enter key. Usefully, the fn key also changes the behaviour of ←, deleting characters to the right instead of left.

Scanning a large collection of old photographic slides

Q I have inherited my dad's large collection of photographic slides. How can I scan them into a Photos library on my Mac?

by NICK EATON

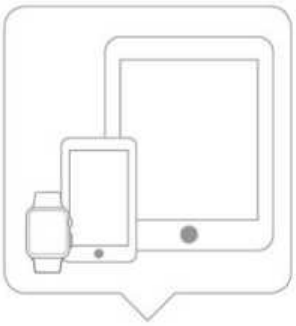
A The wonderful old Nikon and Canon pro slide scanners are still available on eBay, but they will not work with modern Macs. Their less expensive, unbranded equivalents are available from photography equipment retailers, but they lack the same quality and efficiency, and they may not have proper software support for OS X.



Better flatbed scanners come with plastic carriers in which you can mount, and scan, multiple photographic slides at high quality.

Higher quality flatbed scanners such as those from Canon and Epson come with slide carriers, can scan multiple slides at a time, offer as good resolution, and have excellent software support. They should probably be your first choice.

If you have your a digital camera with a suitable screw mount at the front of the lens, you could consider an Ohnar (or similar) slide copier, costing around £100. With a uniform bright source of light, such as bounced flash, and a 16-megapixel digital camera, this can produce superb digital images of most monochrome and colour transparencies. If you can, try each option using some sample slides before tackling the complete collection.



iOS Software

Swipe away your touchscreen troubles and rekindle your love of Apple's mobile devices

iOS devices quick-fire questions

Can I use an iPad Pro as a graphics tablet for my iMac?

Yes! There's an enhanced version of Astropad (£14.99) which turns an iPad into a wireless or wired graphics tablet for your Mac. This now supports the Apple Pencil, and works very well with drawing and painting apps on the Mac. Alternatives include Air Stylus and Limner (£10.99 each), though the latter is awaiting an update to work with iOS 9, so it's unsuitable for the iPad Pro.

How accurate are distances measured by fitness apps?

The underlying GPS technology is now accurate within metres, but as there is always uncertainty in each locational fix, and small errors accumulate. Due to the statistical tendencies in these errors, total distances tend to be greater than they actually are, and will vary from run to run.

How Apple Watch and iPhone stack up to other heart rate monitors

Q **As a keen cyclist and hillwalker, I am interested in using my iPhone 6 to track my performance and routes completed, but I do not want to post that information online. I am tempted to buy an Apple Watch Sport for its heart rate sensor. Is that a good choice, or are third-party devices better supported?**

by DAN ROBERTS

A Until Apple shipped watchOS 2 in September, apps were essentially unable to access the Watch's own heart rate data, so third-party sensors were the only real option. Since then, developers have been steadily adding better support for the Watch and its sensors to their apps. Some, such as Runtastic, can load heart rate data once you have completed a session, but none seems able to display them in real time yet.

The Watch's built-in apps are also of very limited use: Health gives only the most basic information, including hourly heart rate ranges, or you can view all the individual timed measurements. Apps such as Cardiogram and Heart Graph will give you proper graphical displays of that data, which should prove a valuable aid in assessing your performance.

> Since watchOS 2 arrived, apps have been steadily adding better support for the Watch's sensors



The best way to study heart rate data from an Apple Watch is with an iPhone app like Heart Graph.

There are two other significant factors which you should take into account. Acquiring this data at sufficiently frequent intervals will shorten iPhone and Watch battery endurance considerably, so you will need to charge both before exercising, particularly over longer periods. You may also find Apple's Sport Band rather sweaty during exercise, and may prefer a third-party replacement.

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EDITED BY **LUIS VILLAZON**



NEW SECTION!
Inspiring ideas for revamping old Apple kit





Keep your private files safe from thieves, hackers and snoopers with an encrypted file server

These days I keep almost all my data in the cloud. Dropbox and iCloud Photo Library mean my files are available wherever I am and whatever device I'm using. Inevitably, there's some data I don't want to put there. I'm not worried about MI6 or the CIA, but I have teenage sons who sometimes borrow my iPad, and I'd rather keep them out of my friskier photos, private diaries and other embarrassments therein.

Tresorit.com offers encrypted cloud storage, but it's another £8 per month on top of all my other subscriptions, and I'm not sure I have enough secrets to warrant paying almost £100 a year. My first-generation Mac mini with 40GB of free disk space is idle, and it's far too old to be useful as a media server or set-top box, but it's perfect as a secure file vault for sensitive data. Read on to see how to turn your old Mac mini into a file server.



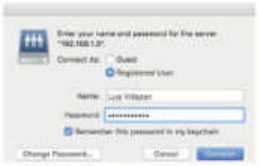
LUIS'S APPLE CLASSIC!

The G4 iMac is the least computer-looking home computer ever made, and its anglepoise arm is probably Apple's finest piece of engineering. The custom-designed circular motherboard, the curved front plate to the DVD drive's tray and the transparent screen bezel are all lovely design touches. But it was the subtle cantilevered action of the screen arm that originally earned the G4 iMac a place on my desk – and kept it there for about five years after I had stopped using the computer itself for anything.

Hardware quick-fire questions

How do I reset the password on an old Mac?

On a pre-Lion Mac, which won't have a Recovery system, you can use Terminal to trick the Mac into thinking it is being set up for the first time. Shut down the Mac, then power it on and immediately hold ⌘+S to start up in 'single-user mode'. Type `mount -uw /` and press ⏎. Follow that command with `rm /var/db/.AppleSetupDone` (there's no space between the full stop and AppleSetupDone) press ⏎, then restart. You'll see the welcome screen that allows you to create a brand new administrator account.



I get an error that says "There was a problem connecting to the server..."

If connecting to your file server from the Shared section in Finder's sidebar throws up this error, a handy workaround is to press ⌘+K and then type the IP address of your file server directly into the 'Connect to Server' window.

A vault for your secret files

Keep the files that really matter to you cordoned off on their own encrypted disk

1 **DVD drive**
Use an install disc to set a firmware password so an intruder can't reset your admin password.

2 **PowerPC G4 processor**
The G4 processor is very slow by today's standards, but it can still cope with encrypting on the fly.



3 **Compact**
Its convenient, boxy shape and small size make the Mac mini ideal for hiding away in a cupboard.

4 **Cool-running**
With no strenuous apps running, the Mac mini generates very little heat, so ventilation isn't an issue.

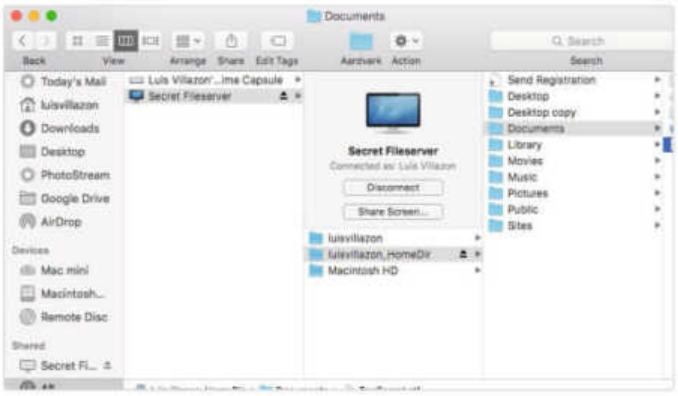


5 **DVI port**
The DVI-I port won't connect directly to most modern displays, but HDMI adaptors are cheap.

6 **Keyboard and mouse**
You can just plug in a keyboard and mouse temporarily when you need to configure something.



You can leave an account logged in to provide network access to files, but ensure you turn on its screen saver and require a password to wake from it.



By turning on FileVault, your private files – those stored in your account's home folder – are kept safely tucked away on their own encrypted computer.

Beyond just my own inquisitive and tech-savvy teenagers, there's another threat I'd like to protect myself from: thieves. If my house is burgled, a thief will almost certainly steal all the desktop and laptop computers lying around in plain view. The cost of replacing the hardware is covered by insurance, but if criminals decide to rummage through the hard disks, they'll find old tax returns and investment portfolio spreadsheets – that could work out much more expensive and inconvenient for me.

Identity theft

Moving these files onto a secret file server gives me much better security than just encrypting them on my everyday desktop or portable Mac. I don't really want my main hard disk encrypted because it's slower and more complicated to administer and back up. It's also more vulnerable because this is the Mac that I use most often. Sooner or later, I'll forget and leave myself logged in, or copy some sensitive files to an unencrypted volume. An old Mac mini has all the power of a networked disk, but it's much easier to set up and maintain because it's running OS X, not some proprietary embedded version of Linux.

There's another big advantage to using a Mac as a file server: I can control access to the hardware. Networked disks are designed to be configured remotely, which means they can also be hacked remotely, but that's much harder to do with a Mac; most administrative tasks need access to the physical machine. For ultimate security, I can lock the Mac inside a metal cash box, with a couple of holes drilled in it for the power and Ethernet cables. A Mac mini runs cool enough that it can easily cope with this treatment without overheating, and while it stays locked in the cash box, with no keyboard or monitor attached, it is effectively tamper-proof. For now, though, I have just hidden it away on the top of a high wardrobe, with its power and data cables running down the back, out of sight.

FileVault limitations

Of course, this setup isn't quite perfect. Since the Mac mini I'm using is still running OS X Tiger, it is using the older version of FileVault, which only encrypts the home folder, not the entire disk. This means that I need to be careful not to leave temporary copies of any private files outside of my home folder. ›

> Moving my files onto a secret file server gives me much better security than just encrypting them on my desktop Mac

Prevent an install disc being used to bypass security by setting a firmware password.



HOW TO Encrypt a disk with FileVault



1 Security preferences

If the items in your file vault contain important financial info, you won't want their secrets to literally go with you to the grave. Set a master password, then write it down and put it in a sealed envelope with your will. Relatives can get at the files in an emergency, but they're kept secret under all other circumstances.



2 Stay logged in

Deselect 'Log out after...' or you'll be unable to access your files remotely. You can protect them against physical access to the server by switching on the option to require the password to wake from the screen saver. Set the Mac to never sleep (in Energy Saver) and the screen saver to come on after three minutes.



3 Start encrypting

Click 'Turn On FileVault' to encrypt your home folder. You'll see a dialog warning you that the process could take some time, but if you start with an empty home folder it takes less than a minute. If you already have secret files in the folder, turn on 'Use secure erase', but be warned that this will take much longer.



Using a wired network connection is faster for large data transfers.

I also need to make sure that I'm logged in at all times on the secret file server. If I try to remotely access it while it is sitting at the login window, OS X will let me connect but I'll just see the encrypted sparse bundle file (a disk image) and all the data inside will remain locked away. Leaving the file server permanently logged in isn't really a security risk, though, because the screen saver is also permanently running. You can't see it, of course, but it means that if anyone tried connecting a monitor to the Mac mini, they will still need my password in order to unlock it and actually do anything.

Keep things safe

In the future, I'd like to come up with a better way of backing up this file server. Backups are even more important for the secret file server than on my regular desktop Mac as there's no way to know how much life is left in this 10-year-old Mac's hard disk. I can't use Time Machine because that needs at least OS X Leopard, so it's simplest to use a 32GB memory stick.

Once a month, I can fetch the Mac mini off the top of the wardrobe, attach a keyboard and monitor to it, and log out of my account. As I explained earlier, this means that when I access the file server remotely, I'll just see the encrypted home folder as a single sparse bundle file. I can copy this encrypted data to the memory stick and keep it in my desk drawer as a fallback. It's a fairly cumbersome back-up routine, but it's the best I can come up with for now.



Next Issue!

Luis finds an old iPod touch at the back of a kitchen drawer and converts it into a useful, space-saving gadget. The iPod, that is, not the kitchen drawer.

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shoot & edit 4K videos

The latest iPhone can record ultra-detailed 4K video.

ANDREW REID explains why you should be shooting with it.

4K displays
group test
p96

Retina displays benefit from having video to show off that is as high-quality as they are. The iPhone 6s and 6s Plus provide a solution with their ability to record 4K video. Until now most smartphones and cameras have shot a very pale imitation of cinema quality, with mushy old 1080p video created by skipping out huge chunks of what the camera sensor actually sees in reality. True 4K video is like looking through a window with crystal clear, 20:20 vision.

The great thing about shooting 4K video is that the quality hike is evident even on regular HDTVs and YouTube. You don't need an 85-inch 4K TV to appreciate the difference in quality. There are other advantages to 4K, and creative techniques simply not possible with plain old Full HD. We'll dive into that soon, but rest assured, to make use of 4K is simple on the surface. Film-making is a broad subject and we'll cover all the important bases – never has it been more accessible.

Here's our guide to get you started shooting glorious 4K movies. As Steve Jobs once said: "For you to sleep well at night, the aesthetic, the quality, has to be carried all the way through".



YOU WILL NEED >

iPhone 6s or 6s Plus

Both of Apple's latest iPhone models are able to shoot the same quality of 4K video. However, the 6s Plus has the advantage of optical image stabilisation for steadier handheld shots.

4K-capable camera

Some photo cameras offer better low light performance and a cinematic shallow depth of field for 4K video. Our camera recommendations include Panasonic's G7, GH4, LX100 and the Sony A7S II.

A Mac with a Retina display

The Retina 5K iMac's display provides enough space to show all the extra detail of 4K video in full. 15-inch models of the MacBook Pro are also capable of smoothly editing 4K video.

iMovie or Final Cut Pro X

For beginners, iMovie offers a simple way to cut together sequences and to set video to music. Final Cut Pro X is a feature-rich alternative used by professionals, but at a basic level it remains easy to use.



4K tips for iPhone 6s

Pick the best app and cinematic settings

What is 4K?

4K is a video standard that offers dazzlingly levels of detail. Although 4K cameras offer four times the detail of Full HD (1080p), the term '4K' comes from the fact that each frame of video is about 4,000 pixels wide.

4K cameras are capable of shooting widescreen eight-megapixel moving images at an epic resolution of 3840x2160 pixels. Before 4K, we recorded and viewed the far less detailed two-megapixel images.

The difference between two and eight megapixels may not seem much if you're used to a DSLR camera with a 24-megapixel sensor, but it makes a phenomenal difference to video quality. 24 megapixels only bumps up resolution to 6K, and here we hit the law of diminishing returns. 4K is the sweet spot for cinematic-looking video for the next decade.

One tip for shooting video stands out above the rest: hold your iPhone in landscape orientation when shooting video. Like a widescreen TV, video is wider than it is tall. Holding the phone upright as if taking a portrait photo doesn't suit the way a video is watched. In portrait orientation the iPhone will capture FaceTime style tall and thin video clips which look terrible on a widescreen Mac or TV screen, with big black borders to the left and right.

There are two flavours of 4K. The frame dimensions of the first, the cinema standard (DCI), are 4096x2160 pixels. The other is the TV standard often called Ultra HD, in which frames are 3840x2160 pixels. You can shoot both resolutions on the iPhone, but the stock Camera app shoots at the latter resolution. To shoot at the former quality, you'll need Filmic Pro (£7.99), which offers the best quality 4K recordings, though its larger file sizes eat up your storage more quickly.

Shooting 4K video isn't just about producing a sharper, more detailed image. It has some interesting creative advantages beyond that. Your recordings can be shown on very large displays without any softness or fuzziness, especially when the audience is at a close viewing distance – in a living room or sitting in front of an iMac, say.

Still photographs good enough for a gallery print of epic proportions can be extracted from 4K video at leisure. So, you can leave your DSLR at home!

You don't necessarily need a 4K display to appreciate quality gains of shooting at the higher resolution, because 4K video makes for better picture quality even on a Full HDTV or computer monitor due to 'oversampling'.

Finally, if you shoot 4K but intend to show it mainly on existing Full HD displays, a smartphone screen or

> You don't need a new display to appreciate the quality gains of 4K

HOW TO TRIM VIDEOS >



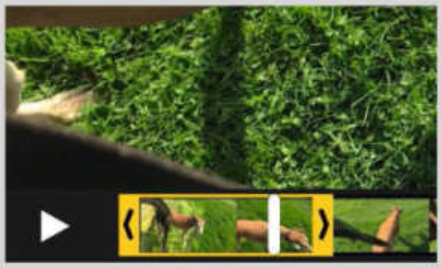
1 Go to Photos

If you have dead time or unwanted content at either end of a video, or you just want to make it shorter to upload to Facebook, you don't need a special app – you can trim it in the Photos app.



2 Select the video to trim

In the Camera Reel, tap the video's thumbnail and then tap Edit. If you're having trouble picking out your video clips, go to the top of the Albums view and select Videos to hide still photos.



3 Trim away in edit view

Drag either end of the yellow border around your clip inwards to trim footage from the corresponding end of the video, then tap Done. You can save the trimmed clip as a new file or overwrite the original.

YouTube, its resolution offers a way to reframe a shot by cropping into the image, much like a digital zoom but without loss of image quality.

Using the Camera app

By default the iPhone 6s and 6s Plus have 4K video turned off. To enable it, go to Settings > Photos & Camera > Record Video and choose the 4K at 30 fps option.

Now when you select the Camera app's Video mode and tap the record button, you'll be capturing 3840x2160 (Ultra HD 4K) footage, rather than the iPhone's default of 1920x1080.

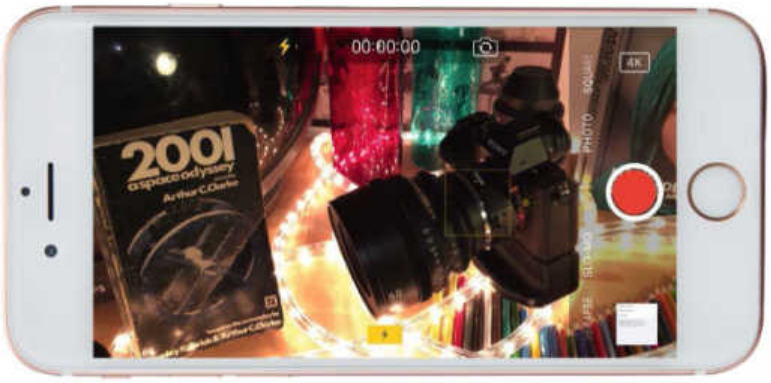
Just be aware that file sizes increase from about 130MB/minute for 1080p to 375MB/minute for 4K. There's enough space on a 64GB iPhone 6s for about 150 minutes of 4K video, as long as you have little else stored on the device. It makes sense to regularly offload recordings to your Mac to edit in iMovie – or use the iPhone version.

Using Filmic Pro

The basic Camera app only shoots 4K video at 30 frames per second. The more frames per second you capture, the smoother the video looks when played back at the same rate – and the more dramatic the level of slow motion effects you can apply later.

The maximum frame rate for 4K video on the iPhone is 30fps, while it's 60fps for 1080p video. The latter is useful for adding a smooth slow-motion speed reduction of up to 50% during editing. (The iPhone also has a built in slow-motion mode at reduced quality). When it comes to viewing clips, 60fps isn't actually very beneficial. 24fps is used by almost all Hollywood films, and gives a more traditional cinematic feel to the picture and motion.

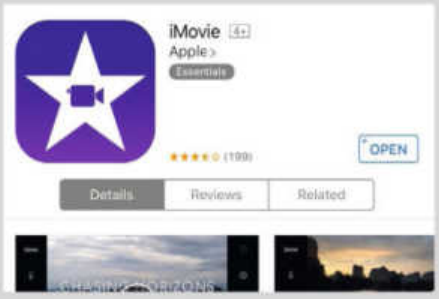
Similar to 60fps video, 30fps is 'smooth' but more in keeping with a home movie or YouTube video than a cinematic masterpiece. On the newest iPhones, Filmic Pro can record 4K video at 24fps, and with lighter compression for a less muddy image. The trade-off is even larger 4K videos than Apple's, yet Filmic Pro also gives you greater control of exposure and focus.



While it's good that Apple's Camera app can record 4K video, get Filmic Pro for better results.

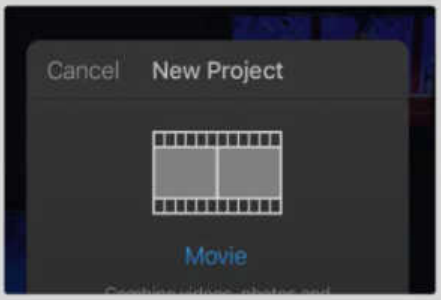
Edit your movie on an iPhone

Three simple steps to splicing a masterpiece



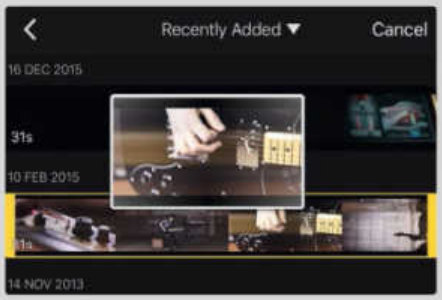
1 Open iMovie

If the iMovie app isn't already on your iPhone, you can install it from the App Store – it's free if you've bought a new iPhone since 2013. 4K editing is only available on the iPhone 6s & 6s Plus.



2 Create a new project

Tap the + icon and you'll be given a choice of creating one of two types of project: a new movie or a new trailer. Select the former and then choose a theme, then tap Create.



3 Edit your project

Tap the film reel icon to add videos and other media to your project: tap an item, then the downward arrow. Swipe to move through the timeilne, and keep adding, trimming and rearranging clips.

Editing 4K on a Mac

Ensure your Mac can cut through pixels like a knife through butter

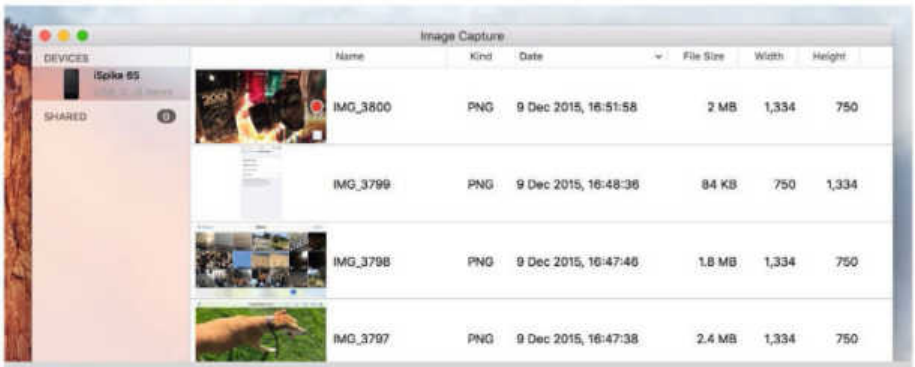
The aim of an editing app is to build up a sequence of videos that have been shot individually in a way that stitches them together with a narrative theme. Editing is an important part of the storytelling process in video production.

Apple makes two big editing apps for videographers: iMovie is aimed at everybody, and Final Cut Pro X is aimed at advanced users and professionals. On the surface, Final Cut Pro X appears quite simple, and it bears a striking resemblance to iMovie. However, while iMovie is provided for free with your Mac and iOS devices, Final Cut Pro X will cost you considerably more: £230.

One of the best ways to learn about editing is to make a short video that's about three to four minutes long, made up of even shorter two- to 10-second clips or 'takes', and set the whole piece to music. The objective is to create a certain mood and a link between the images, the mood of the music, and the content of any lyrics in that music. Try this and you'll discover that it's a great way to begin editing, as well as being a skilful art form that needs a sensitive eye and an emotional grasp of the content.

In iMovie and Final Cut Pro X, the editing environment is fundamentally split four ways, between two monitors, one timeline and one project browser pane. The project browser contains the raw, unedited content you've shot. The timeline represents the film in progress as you edit – it's here that you construct sequences of clips. The first monitor, on the left, is for viewing the raw material and trimming it before taking it onto the timeline and building up your edit. The second monitor (usually on the right side of the screen) is for playing back the timeline itself. Once a clip is added to the timeline, you can also add effects to its picture, changing the visual aesthetic in terms of of contrast and colour. Bear in mind that it helps to keep a consistency of colour and feel between clips that will intercut one after another in a sequence.

The timeline accommodates editing a soundtrack, too. You can use the audio recorded by your iPhone, but it won't be very focussed as the built-in mic tends to pick up everything, including unwanted noise from handling and the background. Adding a different soundtrack on the timeline is appealing as you don't have to worry about recording high-quality ambient audio while recording video.



IMPORT 4K VIDEO >

With your iPhone connected to your Mac using USB, videos can transferred to your Mac in two ways. Firstly, you can open iMovie to import them directly into the editor using File > Import Media, where the phone shows up as a camera so you can browse its contents. Secondly, you can use Image Capture (in /Applications/Utilities) on any Mac to transfer your videos to a folder. The resulting QuickTime files can then be dragged into iMovie or another editor.

The iPhone compresses video using the complex H.264 codec. While this is a clever capture format, it requires a lot of computational power to edit. If you're editing 4K on a slower Mac, such as a 13-inch MacBook Pro or an older model, it may help to convert 4K videos from your iPhone to something easier for your Mac to handle. Apple provides a codec especially for this purpose: ProRes. This is an editing codec, and most Macs will slice through it like butter, even in 4K.

File sizes for ProRes video are much larger than for H.264. Apple describes it as "visually lossless", and you can delete the ProRes proxy files after completing your edit and exporting the finished film. The best app for converting iPhone videos to ProRes is EditReady ($50 – about £33, divergentmedia.com). We recommend ProRes LT to strike a balance between image quality and storage space.

All about compression

As a sequence of many hundreds of still frames, video compression is necessary to fit hours of video into the iPhone's internal storage, or onto memory cards

> One of the best ways to learn about editing is to make a four-minute video



If you're short on space for Final Cut Pro's various panes on a Retina MacBook Pro, try shrinking the window furniture by picking a higher 'looks like' resolution in the Displays preferences pane.

on other types of video camera. The most basic way this is done is to store every frame and compress each one of them like a static JPEG image. However, the iPhone uses a more advanced compression method, known as H.264. This records whole frames at spaced-out but regular intervals, and interpolates the frames between them to conserve space.

An advanced processor is used to predict what has changed between the two full frames. This means not every frame has to be stored individually as it comes off the camera's sensor, just the changes between two points close together in time. This saves a lot of space, but on top of that H.264 uses compression in terms of 'bit rate' (a cap on bandwidth that can be used), and also how large the gaps are between full frames. The higher the bit rate and the shorter the gap between full frames, the more of the original details are preserved, rather than blurred to save space.

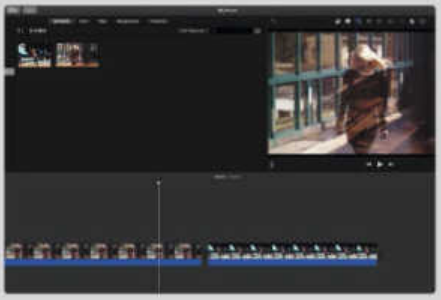
Understand frame rates

Video is a sequence of frames, or still images, captured one after the other. If you capture frames at 5fps, there are not enough frames of them to create the illusion of real movement – such a slow frame rate would look too jerky.

A frame rate of 24fps is where the magic happens. This isn't so slow that it looks unrealistic or staccato – and it isn't so smooth that it looks like a video game or a 1990's camcorder. In fact, 24fps is the standard frame rate captured by Hollywood film cameras, both analogue and digital alike.

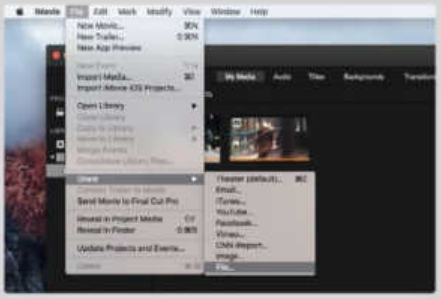
Export your 4K movie

Show the world your pixel-packed flick



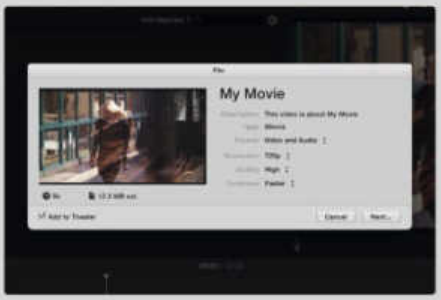
1 iMovie on a Mac

When you've finished editing in the Mac version of iMovie, choose File > Share and take a look through the list of places and methods to which you can publish your creation direct from the app.



2 Choose where to export

Unless you want to send your video to a single, preset destination, such as Facebook, we suggest picking 'File' as it keeps quality, as well as flexibility to use that high-quality copy in multiple places.



3 Choose a file format

Your edited masterpiece will be saved as one large file. Choose an output resolution – for example, 4K, 1080p or 720p – on this screen and click Next to start the export process going.



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EDITED BY **ALEX BLAKE**



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21.5-INCH iMAC WITH RETINA 4K DISPLAY p90

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★★★★★
A brilliant thing in all regards, and worth every penny

★★★★☆
Strongly recommended; any flaws are only minor concerns

★★★☆☆
Worth considering, though there may be better options

★★☆☆☆
Fundamentally flawed; look at alternatives as a priority

★☆☆☆☆
A waste of your money and everyone's time; do not buy!

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Awarded to a five-star product we believe is truly exceptional in its category. Given solely at the discretion of the Editor.

Given to a hardware or software product that might not be the very best in its category, but is a noted for affordability.

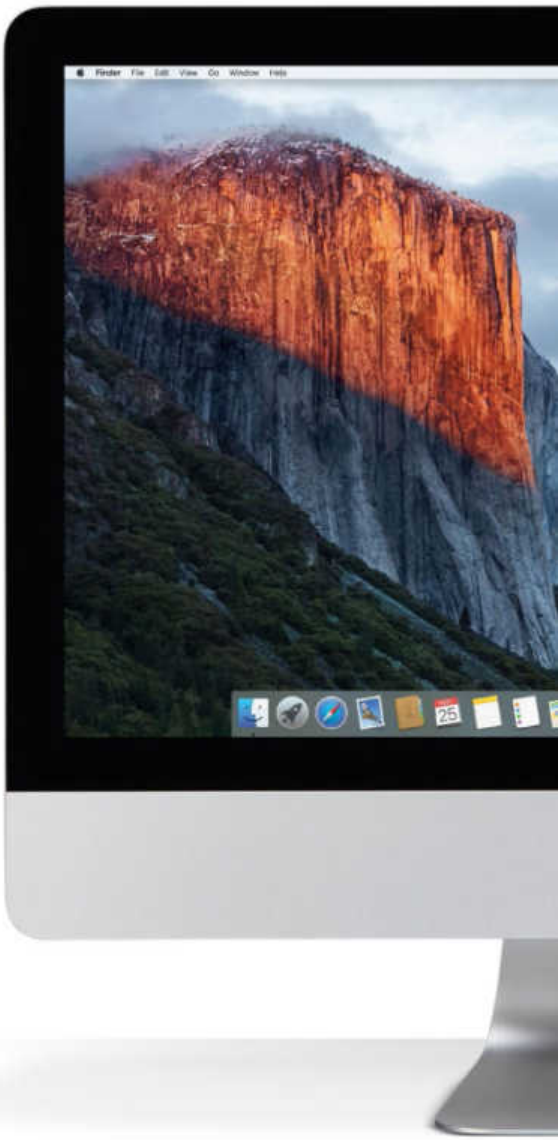
Our group test winner gets this award for being the best of its kind when pitted against other comparable products.

21.5-inch iMac with Retina 4K display (Late 2015)

The smaller iMac gains a 4K display, but it's not quite the hot rod we expected

Reviewed by **MATT BOLTON**

› £1,199 › **MANUFACTURER** Apple, apple.com
› **DISPLAY** 4096x2304-pixel P3 IPS › **PROCESSOR** 3.1GHz Intel Core i5
› **MEMORY** 8GB › **STORAGE** 1TB 5,400rpm hard drive › **GRAPHICS** Intel Iris Pro 6200 integrated graphics processor › **CONNECTIVITY** 4x USB 3.0 ports, 2x Thunderbolt 2 ports, SDXC port, Gigabit Ethernet, 802.11ac Wi-Fi, Bluetooth 4.0



There are no new expansion ports here, though we expect Thunderbolt 3 will appear on the 27-inch model before this.





We've nearly reached saturation point with Retina displays. The only holdouts in Apple's hardware line-up are the MacBook Air, the Thunderbolt display, and, until recently, the 21.5-inch iMac. Now, though, there is a Retina 4K iMac, which packs a 4096x2304-pixel display into the same body as the regular, Full HD iMacs.

At £1,199, the Retina 4K iMac is the top-of-the-line 21.5-inch model (just like the Retina 5K iMac was in the 27-inch line-up when it first appeared), and so comes with the most powerful processor among iMacs of the smaller size: a 3.1GHz quad-core Intel Core i5 chip – a small boost over the 2.8GHz quad-core CPU in the mid-range 21-inch iMac. The Retina 4K model only costs £150 more than the next iMac down, so its fancy screen and slightly faster processor are the only differences. It has the same Intel Iris Pro graphics chip to draw images (despite having to do so at far higher resolution), the same 8GB of RAM, and – most frustratingly – the same 5,400rpm hard drive.

We'll come back to these specifications, because we can't help but start our discussion of this particular iMac without a nod to its screen. Usually, when Apple changes one of its devices to use a Retina display, that display is four times the resolution of the old screen (by doubling the number of pixels in both width and height), which in the 21.5-inch iMac's case would be the Ultra HD standard of 3840x2160 – but the 4K iMac actually has more pixels than that. The reason appears to be that Apple is using the same panels from its 5K screens, but cut to the smaller size, and this packs in the pixels more densely.

Raw potential

What difference does this make? Well, none to most people; the screen is as crisp and clear as any other Retina display. However, it has one minor and one larger advantage for professionals. The minor point is that it's capable of natively displaying the Digital Cinema 4K video recording standard, which is 4096x2160 pixels – a few affordable 4K cameras shoot at this resolution. The larger benefit of the panel being the same one used



in the Retina 5K iMac is that it supports a wider colour range than any of Apple's previous screens. The new P3 display panel technology can show 125% of the RGB colour range, so you can literally see colours in your photos that you couldn't have before – provided you have RAW photos to process.

When photos are saved as a standard such as JPEG, they're limited to a certain range of colours (usually the sRGB range, or an equivalent). But RAW photos usually have a wider range of colours captured by the sensor – it's just that these get compressed. With a pro editing tool and your RAW files, you can now explore this wider colour range, which gives expanded options for printing more vibrant photos. High-end video editors can get more from the wider gamut, too.

For most people, it's admittedly not that big a deal. When you're able to make the most of it, though, it's wonderful. The extra vibrancy is fascinating in really beautiful images. When you're using the web, watching standard videos, opening documents and so on, the big change comes from simpler things. The Retina 4K iMac's screen is simply brighter, sharper and more pleasant to work with than just about any desktop display ever. It's bold and clear, and because of the way Retina displays work, everything is still legible while remaining smooth.

Any image looks beautiful at this high resolution, and the screen has good contrast and black levels. If you've previously opted for a 27-inch display for the extra workspace it gives you, this iMac might convince you to go smaller again; its basic setting is the equivalent of a 2048x1152-pixel screen, but you can tell OS X to render its desktop at the equivalent of a 2560x1440-pixel screen

YOUR OTHER CHOICES...



iMac 21.5-inch 2.8GHz £1,049

SPECIFICATIONS

- 1920x1080-pixel IPS display
- 2.8GHz, quad-core Intel Core i5 processor
- 8GB memory (max 16GB)
- 1TB 5,400rpm hard drive
- Intel Iris Pro 6200 integrated graphics processor
- 4x USB 3.0 ports, 2x Thunderbolt 2 ports, SDXC port, Gigabit Ethernet, 802.11ac Wi-Fi, Bluetooth 4.0



iMac 27-inch 3.2GHz £1,449

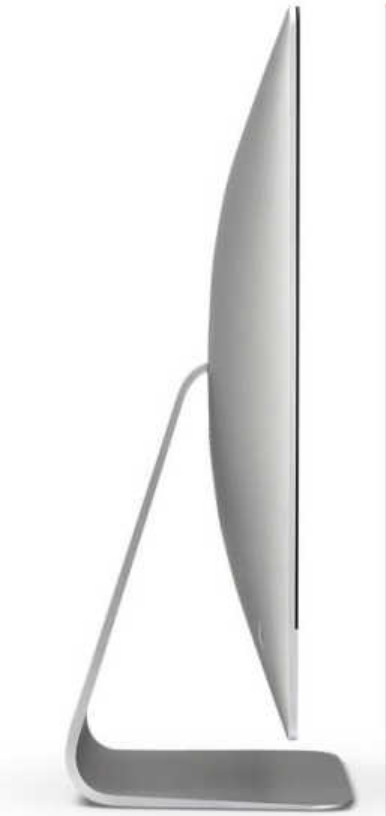
SPECIFICATIONS

- 5120x2880-pixel IPS display
- 3.2GHz, quad-core Intel Core i5 processor
- 8GB memory (max 32GB)
- 1TB 7,200rpm hard drive
- AMD Radeon R9 M380 discrete graphics processor
- 4x USB 3.0 ports, 2x Thunderbolt 2 ports, SDXC port, Gigabit Ethernet, 802.11ac Wi-Fi, Bluetooth 4.0



Christian says...

On the one hand, the existence of a 21.5-inch iMac with a 4K display is exciting. However, it's disappointing that Apple doesn't just suck up the relatively small cost of equipping it with a Fusion Drive to make this Mac a truly tantalising computer without the need for further customisation.

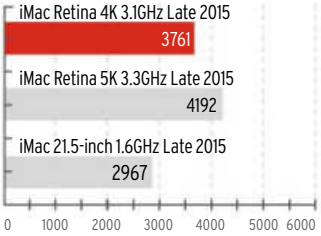


The extra pixels in the Retina 4K display have no bearing on the iMac's ultra-slim profile.

Aside from the high-res screen, the iMac's appearance is unchanged.



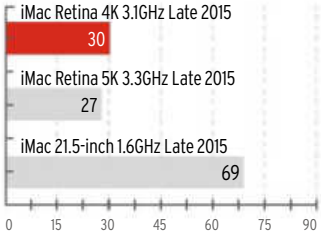
BENCHMARKS Our analysis explained



Index score (higher is better)

GEEKBENCH 3 SINGLE CORE TEST

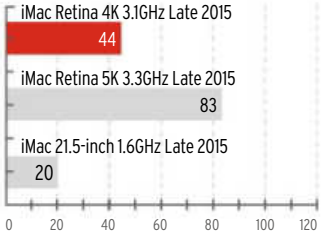
This tests the capability of a single processor core. Many more common tasks on a Mac will only use a single core at a time. Intel's Turbo Boost technology comes into play here.



Duration (lower is better)

HANDBRAKE VIDEO ENCODING

We transcode a Blu-ray-quality video file into H.264 format using Handbrake to test multi-core processor performance, which pushes all cores to maximum output.



Frames per second (higher is better)

BATMAN: ARKHAM CITY 1080P

For a real-world gaming test, we use the benchmarking tool in the game Batman: Arkham City, with the graphics settings set to High and the resolution set to 1080p.

and then scale that down to fit this iMac's display. We found this really useful, although consequently text becomes quite small.

Drive slow

You might be won over purely by the screen, and that's fair enough, but it's worth looking at the iMac's other parts. The Intel Core i5 processor is impressive, and only about 10% slower than the one in the high-end Retina 5K iMac. There's an argument that this is the most important component, and that, when combined with 8GB of RAM, it will provide most people with all the power they need.

The Iris Pro graphics chip is considerably less powerful than a dedicated GPU, but it can at least play some graphically intensive games at above the magic 30fps mark. It does its main job well enough – we didn't notice any significant jerkiness when scrolling, or any similar problems in general use. While the graphics choice is a little disappointing, the rest of the core spec is solid. Note that if you want more than 8GB of RAM, it must be bought with the iMac (which can't be upgraded later) and the maximum is 16GB, which is rather low for some pro tasks.

However, we take issue with Apple's choice of storage. The 5,400rpm drive is slow, and you can feel it. Working with large files, such as the high-res photos you'll want to show off on your 4K display, is frustrating, and playback often stuttered when editing 4K videos in iMovie – which seems like an obvious job for this Mac. Even System Preferences took more than five seconds to load, compared to less than one on a two-year-old MacBook Pro.

Flash storage improves everyday tasks considerably, and that this Mac doesn't have a Fusion Drive is totally ridiculous – especially since 1TB Fusion Drives now include only 24GB of flash storage. Apple, you can afford to throw that in for this price. As it is, a Fusion Drive is an optional £80 upgrade – galling, but we strongly recommend you add it.

Mac FORMAT

VERDICT

Still a fantastic computer, with its spectacular screen made even better, but do look at the mid-range option.

★★★☆☆

- Stunning 4K screen
- Strong CPU power
- Slow hard drive
- Slightly weak graphics spec

DJI Osmo

Get to grips with smooth camera movement for a great price

Reviewed by **ANDREW REID**

› £549 › **MANUFACTURER** DJI, dji.com
› **RESOLUTIONS** 4K (4096x2160), Ultra HD (3840x2160), 1080p



Your iPhone is firmly held in place by the Osmo's clamp.

Osmo opens up a world of sweeping movements that would be impossible to pull off with just a DSLR or a smartphone

Mac FORMAT VERDICT

› Innovative and great fun to use, this is the most powerful video stabilisation for the price, though it is not bug-free or of DSLR image quality.

★★★★☆

⊕ Great stabilisation
⊕ Well-designed app
⊕ Detailed yet noisy 4K
⊖ Doesn't compensate for bounce of walking

Now you can recreate Garrett Brown's legendary Steadicam work on The Shining with what is basically a high-tech selfie stick. The Osmo is very close to the overall look and feel of a Steadicam, yet it fits in a backpack, weighs 200g, and can be used one-handed. It opens up a new world of sweeping camera movements that would be impossible to pull off with just a DSLR or smartphone by itself.

It's in a league of its own versus similar three-axis gimbal solutions already available. The kit comes with a Zenmuse X3 gimbal and camera – the key hardware– while the rest is essentially an app and a pistol grip, which also houses the battery. This runs down very quickly, so spares are essential. The Zenmuse X3 uses the same three-axis stabilisation brushless gimbal and 4K camera found in the £2,600, semi-pro Inspire 1 drone, so it represents great value for money.

Steady your expectations

As admirable as that value and performance is, the X3's image quality isn't the best. The gimbal and camera head are inseparable, so a GoPro plays no part with the Osmo, whereas perhaps it should. DJI's flat picture profile, designed for colour grading and optimal dynamic range, isn't very effective at delivering a cinematic image compared to other small cameras, such as the Sony RX100 IV with 4K S-LOG. The wide-angle lens can't focus closely – it's designed for a drone and so is fixed to infinity and unable to focus closer than about two metres. In low light, it falls even further short of the benchmark set by the tiny RX100 IV and its one-inch sensor.

An iPhone is essential, since it acts as a touchscreen control pad and monitor. Video is sent from the Osmo's camera over a direct Wi-Fi link to the phone, which clamps into an articulated arm that you can rotate for comfortable viewing angles. Pairing with an iPhone 6s Plus, say, gives you a much larger and higher resolution display than any DSLR or mirrorless camera.

However, the wireless link is imperfect. Sometimes video doesn't appear until you reopen the app, and we had issues with the Cinema 4K mode freezing the link. The screen often shows a very compressed image, and it's prone to lag from interference. Nor are things fuss-free; you can't just turn on and shoot – you must clamp in your phone, open Wi-Fi settings, then the app, and even then you're not quite done pressing buttons.

Such issues are perhaps forgivable for £550 given the Osmo is packed with tech and there's very little else like it available. Build quality is phenomenal, inspiring confidence that the very sturdy and elegant clamp will not let go of your iPhone accidentally.

Handling is great, and we love the pistol grip trigger, which levels out the camera on a double-tap (useful as the camera often gets off-kilter) and rotates for selfies on a triple-tap. There's also a buttery-smooth joystick for panning and quick aiming.

The Osmo's stabilisation is unrivalled for the price, and it's much easier to shoot with than a traditional stabiliser. Pros might bemoan the X3's image quality and fussy wireless link, but most people will love it. We'd happily pay a bit more for a model between this and the £1,800 pro-level X5.

Synology RT1900ac

A powerful router from a surprising source

› £153 › **FROM** Synology, synology.com
› **FEATURES** 802.11ac Wi-Fi, Gigabit Ethernet, USB and SDXC ports



Mac FORMAT VERDICT

› It's expensive, but the RT1900ac ticks all the right boxes with its performance, feature set and ease of use.

★★★★☆

⊕ Top-of-the-line performance
⊖ No built-in modem

Synology has jumped the shark to launch its first ever wireless router, and it's a good one too. It's robustly designed and setting it up couldn't be simpler.

The router has all the top-notch specs you'll want, with four Gigabit Ethernet ports joined by the latest 802.11ac wireless standard, plus a USB 3.0 port for printers, 3G/4G modems or extra storage, and an SDXC card slot, too. 802.11ac ensures super-fast connections over a wider range. Our tests showed excellent wired transfer rates up to 950MB/s, and wireless rates of 140MB/s and 420MB/s on the 2.4GHz and 5GHz bands, respectively. A feature called beamforming can prioritise wireless traffic so your key devices always get the bandwidth they need.

Another standout is the Synology Router Manager (SRM) software, which is similar to Finder in layout, making your router's configuration tools easy to navigate and tweak. There's even an app centre, allowing you to add extra goodies including media, VPN and DNS servers.

The RT1900ac is an expensive solution – at this price it should include a modem – but you will at least feel the benefit from its blazingly fast performance. NICK PEERS

Edifier R1700BT

Excellent speakers for a great price

› £90 › **FROM** Edifier, edifier.com
› **FEATURES** Bluetooth, RCA stereo in/out



Mac FORMAT VERDICT

› A fine speaker set for the price, and ideal for a Mac setup with some classic style.

★★★★☆

⊕ Great look and finish
⊕ Rich, detailed sound

Macs come with decent speakers, but nothing that compares to having a good external set. These speakers are definitely that.

Finished in rich, dark walnut vinyl, they look the part, too. This two-speaker system packs everything into its left and right units, including subwoofers.

The right speaker features the RCA stereo input and output, the power input, and the controls. The left speaker connects to the right with a single cable, which carries both sound and power. They're easy to set up – plug them in, bring up Bluetooth on one of your audio devices, and they're ready to connect.

The output is impressive: rich and full right from the first beat, these are very nice speakers. They're not quite 'blow you away' quality, but for the price, they do a fantastic job. Their built-in subwoofers create measured, pleasing bass that doesn't overwhelm the rest of the sound. The mid range is full of detail: breathy vocals jump out, and you can hear distinct voices in a group easily.

They're not quite as bright and open as the best speakers, but they also lack the high price tag while still holding their own. They work well for movies or videos too. There's no AirPlay, but that's not such a big deal. MATT BOLTON





Logitech Create

If you want your iPad Pro to be more laptop than tablet, pick this

› £110 › **MANUFACTURER** Logitech, logitech.com
› **REQUIRES** iPad Pro

Typing comfort ★★★★☆

This keyboard has by far the more traditional feel, and so you can just start using it without retraining your muscle memory. There's not as much travel and bounce as from Apple's keyboards, but it's eminently useable.

Fit and portability ★☆☆☆☆

This is where we really dislike this keyboard. It's heavy and bulky. Worse, it's a pain to fit and remove. It's fine if you always want to have a hardware keyboard attached to the iPad, but tiresome if not. It covers the speakers, too.

Keyboard layout ★★★★★

Much better than Apple's – or at least, more familiar. The Smart Keyboard is currently only available in US layout, but here we have a UK one, with a double-height Return key and an inverted-T arrangement of the arrow keys.

Other features ★★★★★

Having dedicated keys for playback, volume, lock, Home screen and so on is beneficial – the last of those is better than the ⌘+H shortcut as it can also return you to the first Home screen. Three-level backlighting is welcome, despite being uneven. The case covers the iPad's back, too.

Smart Keyboard

Slim, light, and it doesn't take long to adapt to the odd feel of its keys

› £139 › **MANUFACTURER** Apple, apple.com/uk
› **REQUIRES** iPad Pro

Typing comfort ★★★☆☆

The first time you set fingers to keys, you'll probably hate it. The keys have a surprising, rough texture, and they feel almost dead; there's very little tactile feedback – but after a few hundred words you can imagine writing a novel on it.

Fit and portability ★★★★★

It snaps magnetically to the iPad's left edge, like a Smart Cover, so it's easy to add when you want to type and detach when you're done. The initially baffling flaps of material are actually logical, and it adds surprisingly little bulk.

Keyboard layout ★★☆☆☆

It's annoying that this keyboard currently comes only in a US layout. Even once that's remedied, we'll miss the keys for playback controls, brightness and more. The arrow keys' arrangement will mess with your muscle memory.

Other features ★☆☆☆☆

One star in this category because this keyboard has zero other features aside from the basic function of covering the iPad's screen. It's typically Apple: highly focussed on its core function. It's worth noting is that, unlike Logitech's offering, its keys don't rest against the screen when closed.

› We want to love this comfy, feature-packed keyboard, but it's a hassle to fit. Good if you'll use your iPad more as a laptop than a tablet.

★★★★☆

Mac FORMAT VERDICT

› We lament its lack of backlighting, shortcut keys and UK layout, but its low profile and easy fitting make this the best iPad Pro keyboard.

★★★★☆

4K DISPLAYS

If you want 4K pixel power, which screen packs the hardest punch?

Reviewed by **ORESTIS BASTOUNIS**



MONITORS ON TEST...

- Acer S277HK
- AOC U3277PQU
- Asus PB279Q
- Philips 241P6VPJKEB
- ViewSonic VP2780-4K

Since we last looked at 4K displays, panel technology has matured considerably, as has the Mac itself. Although a 4K screen will work with just about any Mac, to get the best results you need DisplayPort 1.2 for smooth 60Hz output. This is supported by most Macs from 2013 onwards (see http://bit.ly/4KMacs), from the iMac to the mini – although in the case of the 2015 MacBook, you'll need an adaptor.

A 4K display obviously costs more than a display that supports 1080p resolution (1920x1080) or 1440p (2560x1440), but the price difference is narrowing. To make it clear, 4K refers to dimensions of 3840x2160 pixels, a huge number that can either be used in a 'Retina' mode, with the same pixel-doubling technique used on other Apple devices, or as a gigantic desktop, giving lots of space to work with multiple documents.

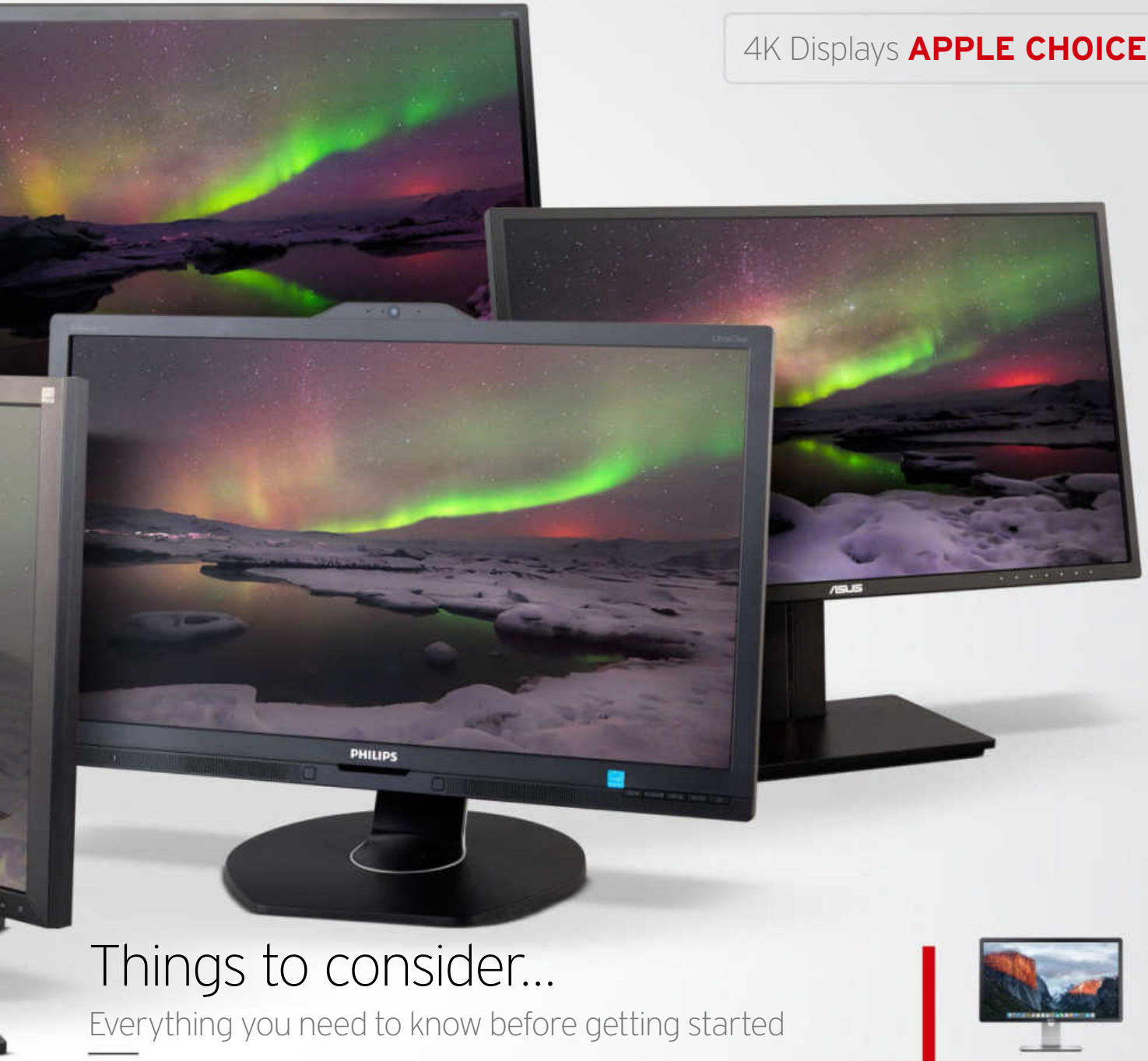
We Apple users can at least feel a little smug, thanks to better scaling support baked into third-party Mac apps than those on offer to our Windows-using chums.

You pay considerably more for a 4K display that has additional extras like even better colour reproduction or gaming-related features such as adaptive-sync technology, but these features are unnecessary for a great external 4K display. All of the displays on show today provide more than enough to satisfy most people's needs.

We've decided to focus solely on IPS technology in this month's group test, picking five screens with sizes ranging from a comfortable 24 inches to a monstrous 32 inches. These are all premium monitors, with 10-bit panels that offer ultra-high colour accuracy, perfect for graphic designers and general computer use.

How we tested

We assessed each display's image quality using a colorimeter (Spyder4Elite). It tests brightness and contrast levels, white point and black point, measured in candelas (cd/m^2). It analyses the brightness uniformity, showing deviation across the panel. This matters to graphic designers – high uniformity means you know the colours are precisely accurate.



Things to consider...

Everything you need to know before getting started

1 TN or not TN?

The 4K display market is split between two competing display technologies – Twisted Nematic (TN) and In-plane switching (IPS). The latter costs a little extra but presents better overall picture quality.

2 60Hz output is essential

To use a 4K display properly, you need 60Hz output for smooth pointer movement; 4K at 30Hz is juddery and quickly becomes irritating. 4K at 60Hz is only supported by DisplayPort 1.2, found on most recent Macs.

3 Get your angles right

TN screens have inferior viewing angles. Unless you view a TN screen roughly head on, you'll notice slight colour shift, so yellows can appear slightly orange, or reds verge towards purple. None of this happens with IPS.

4 10-bit temptation

High-end displays now have 10-bit panels, raising the maximum number of colours to 1.07 billion. This makes a big difference to image quality and colour accuracy, and all the screens on test here have 10-bit panels.

5 Easy on the eyes

Many displays now incorporate a flicker-free panel and low blue light mode, both of which are designed to reduce eye strain during prolonged use.

6 Scaled to perfection

OS X lets you scale graphics and text so it can be used in either its native pixel-for-pixel mode (with a giant desktop), or like a Retina display, which presents the desktop, windows and icons at normal physical size but rendered with perfectly crisp curves and superb detail.

Higher...

› For far greater colour accuracy, Dell's UltraSharp UP3216Q has 99% Adobe RGB coverage and superb overall picture quality.



...or lower?

› Save about £100 with Acer's CB240HYK, which we found for less than £250. It lacks a 10-bit panel, but is still based on IPS tech.

Test 1 Design

Beauty or the beast?



The metallic casing of Acer's S277HK looks fabulous, and it has a very unusual stand that supports the panel on the right, with a particularly thin bezel. However, though you can tilt it back and forth, the downside of this stand is the inability to rotate, raise or lower the screen.

The look of the Asus PB279Q isn't exciting at all, while ViewSonic has gone with a dark grey bezel and frame, which looks fine next to a Mac, but it has a gigantic metal stand.

You might think AOC's 32-inch display would be unwieldy, but its sturdy frame means it sits securely on a desk. Philips' 24-inch 241P might seem small, but it hits a sweet spot for saving space, particularly as an external display for a laptop. Unfortunately, the large speakers attached to the lower part of its bezel make it much wider, and it looks hideous.

TEST RESULTS

Acer S277HK	★★★★★	Philips 241P6VPJKEB	★★★☆☆
AOC U3277PQU	★★★★☆	ViewSonic VP2780-4K	★★★★☆
Asus PB279Q	★★★★☆		

Test 2 Picture quality

The all-important factor



As we said earlier, display technology has moved on a lot in the last few years, which is obvious from the amazing picture quality offered by the majority of modern screens. Without a doubt, that includes all five monitors we tested –every one of them impressed us in this particular test.

The Spyder colorimeter measures the overall colour accuracy with a ΔE score, which reflects the accuracy of colours against determined values. With a 10-bit panel – the type found in all of these displays – capable of 1.07 billion colours, you can expect much better out-of-the-box colour accuracy – with ΔE results under 2 or even under 1 – than you ever could before. Generally, a result under 3 is seen to be perfectly acceptable for good picture quality.

We then calibrated the monitors and took measurements again. Until 10-bit panels came along, the calibration process would vastly improve the colour accuracy of a display, but now high-quality screens such as these deliver great picture quality right out of the box. In fact, calibration can even reduce the measured image quality, although we found that it does still present a better image, reducing the yellowing and shifting colours to the blue end of the spectrum.

The evidence is borne out in our results. The colour gamut across all five contenders was very similar – every single one achieved 100% sRGB, with Adobe RGB results ranging from 79% to 81%. This really is a negligible difference that will be unnoticeable in actual use.

> High quality screens such as these deliver great out-of-the-box picture quality, and calibration can reduce it

Contrast ratios hover around 600:1, with Asus achieving 690:1 with its PB279Q and Acer the lowest at 560:1. Similarly, the displays' brightness levels range across a narrow band from 290 to 320 cd/m², with the exception of the ViewSonic VP2780-K4, which hits 400 cd/m².

All five screens ship with a ΔE under 1, with ViewSonic the lowest at 0.41. Calibration slightly adjusts the white and black points, but in general and based on our subjective use of all five screens, we can confidently say you can expect an excellent image from all of these 4K IPS displays.

TEST RESULTS

Acer S277HK	★★★★☆	Philips 241P6VPJKEB	★★★★☆
AOC U3277PQU	★★★★☆	ViewSonic VP2780-4K	★★★★★
Asus PB279Q	★★★★☆		

Test 3 Ease of use

Just how intuitive are the displays?



Setting up a monitor is usually easy, but altering a setting via the on-screen display (OSD), often requires wading through a set of menus to find it. This is where the five monitors on test differ significantly.

Acer's small icons and menus don't work that well. There's no text, but you learn which icon goes to the correct menu. AOC's OSD looks bland, but is easy to navigate, with plenty of settings and options. Philips uses a simple menu system that's likewise easy to use, while ViewSonic relies on a single pair of context-sensitive buttons labelled 1 and 2, which is confusing as you have to constantly work out what each one does.

Asus undoubtedly wins this test. Its menu system is top-notch, with clear and concise labelling that means you're never far away from the setting you need.

TEST RESULTS

Acer S277HK	★★★☆☆	Philips 241P6VPJKEB	★★★★☆
AOC U3277PQU	★★★★☆	ViewSonic VP2780-4K	★★★★☆
Asus PB279Q	★★★★☆		

THE WINNER AOC U3277PQU

The biggest screen takes the crown

In our last group test of 4K displays there were slim differences in picture quality, but this time we could barely fit a knife in the gaps, making it tough to choose a winner. The quality of IPS tech is clear. ViewSonic's screen stands out though, as it's 25% brighter than the others (but you really pay for the privilege).

In terms of features, Asus takes the lead with its wide array of inputs, along with its flexible stand and good sound. Meanwhile, the Acer looks great, but the stand's unusual design is inflexible.

Overall, it's the massive display area of AOC's U3277PQU that most grabbed us. We think a large display such as this benefits all aspects of Mac use. Having a massive desktop for working on tasks side by side is amazing, and works superbly with the split-screen functionality of El Capitan. The picture quality and contrast ratio are excellent, and even the price is reasonable. This combination of size, quality and price meant it hit the sweet spot and won out in the end.



AOC's behemoth of a screen just pipped it, but you'll be happy with the quality of any of the five displays on test.

Having a massive desktop for working on two tasks at once works superbly with El Capitan's split-screen mode



Paul says...

Our test just goes to show that we're spoilt for choice when it comes to Ultra HD displays. I find it amazing how much prices for 4K displays have dropped recently, so if you're looking to upgrade your monitor now is a fantastic time to do it. 2016 may well be the year of 4K!

How do they compare?



THE SPECS	ACER S277HK	AOC U3277PQU	ASUS PB279Q	PHILIPS 241P6VPJKEB	VIEWSONIC VP2780-4K
PRICE	£399	£574	£545	£492	£699
SCREEN SIZE	27-inch	32-inch	27-inch	24-inch	27-inch
VIDEO CONNECTIVITY	1x DisplayPort, 1x Mini DisplayPort, 1x HDMI, 1x DVI	1x DisplayPort, 1x HDMI, 1xVGA, 1x DVI	1x DisplayPort, 1x Mini DisplayPort, 4x HDMI	1x DisplayPort, 1x HDMI, 1xVGA, 1x DVI	1x DisplayPort, 1x Mini DisplayPort, 3x HDMI
BRIGHTNESS (CD/M²)	310	290	313	320	414
DELTA E (ΔE)	0.87	0.86	0.65	0.62	0.41
DATA CONNECTIVITY	None	2x USB 2.0, 2x USB 3.0	None	2x USB 3.0	4x USB 3.0
ADOBE RGB %	81	79	80	79	80
DESIGN	★★★★★	★★★★☆	★★★★☆	★★★☆☆	★★★★☆
EASE OF USE	★★★☆☆	★★★★☆	★★★★☆	★★★★☆	★★★★☆
PICTURE QUALITY	★★★★☆	★★★★☆	★★★★☆	★★★★☆	★★★★★
FINAL VERDICT	★★★½☆	★★★★½	★★★★½	★★★★½	★★★★½

PrintLife 3

Dream it, inkjet it

› £18.99 › **FROM** Chronos, chronosnet.com
› **NEEDS** OS X 10.11


There are plenty of templates (once you download them all).

Mac FORMAT VERDICT

› Fun and versatile, if you don't mind poking around for what you need.

★★★☆☆

⊕ Lots of templates
⊖ Feels a bit of a jumble

PrintLife belongs to a tradition of print project apps that goes back to the first home computers. You can choose a template, replace the text and pictures with your own, and go... or you can do a lot more.

This version uses a single window, although you can undock the panels on the right if you prefer. Editing happens in the Design tab, while Preview shows how your layout will print.

Click a template's grey placeholder box to replace it with your own photo or one of hundreds of supplied graphics. To get more creative, you can drag backgrounds and shapes on to your layout, apply colours and effects, and add your own text.

You can merge details from the Contacts app to print sets of items, or import text files. There are even smart elements: a warehouse label template includes a Code 39-style barcode generated from letters and numbers you type in or import. Our projects printed correctly, and there is a calibration feature to position output precisely, but when we used Document Setup to change the paper size it messed up our design, and this couldn't be undone.

Printer owners from kids upwards will find this app handy, and some of its features are really quite clever – but consistency and usability still need work.

ADAM BANKS

Graphic

An accomplished illustration app

› £22.99 › **FROM** Autodesk, graphic.autodesk.com
› **NEEDS** OS X 10.6 or higher



Tool options appear in the palettes on the right.

Mac FORMAT BEST VALUE

Mac FORMAT VERDICT

› A genuine alternative to Adobe Illustrator that works as well on iOS as it does on Mac.

★★★★☆

⊕ Easy-to-use tools
⊕ Bargain price

Formerly known as iDraw, Graphic is now part of the Autodesk family. The new version of the illustration app comes with new tools, some under-the-hood updates for El Capitan, and support for pressure-sensitive styluses and Force Touch trackpads.

While the fixed interface can limit screen estate, it does enable a simplistic approach, allowing tools' effects to be tweaked on screen rather than using a menu or hidden pop-up palette.

It's the little touches that make Graphic a joy to use, such as the way it handles type on a path, and the way the pencil tool tidies up your line to create a neater curve. We also love the ability to edit and create brushes with tapering and different shapes, which can then be saved to a library – as can shapes themselves. Graphic also has tools for technical drawing, allowing you to add labels and dimensions to a schematic. Designers can export layered PSDs, complete with layer effects and transparencies.

Graphic also offers an iPad version that's essentially the same as the Mac one, meaning it really is great, but the new iPhone edition uses a simpler, pared-down interface that can be a little bit fiddly. However, its use of Handoff and iCloud Drive means your files can be seamlessly moved from one device to another.

ALEX THOMAS

AmpliTube 4

Turn your Mac into a home studio

› £149.99 › **FROM** IK Multimedia, ikmultimedia.com
› **NEEDS** OS X 10.7 or higher


Amplitube 4 mimics the look of classic amp setups, as well as their sound.

MacFORMAT VERDICT

› An excellent upgrade for the price of an effects pedal, but lacks Retina display support.

★★★★☆

⊕ Tinker for hours
⊖ Lots of IAPs

The fourth version of this guitar amp modeller is a hefty overhaul. As with previous versions, it can be used as a standalone app or as a plug-in to your favourite digital audio workstation, such as Cubase, Logic Pro or GarageBand.

The redesigned cab room allows you to build your own setup from a dizzying array of amps, cabinets, speakers and microphones, choose where to place the mics, and even specify the kind of room which houses the cabinet.

Unfortunately, you soon hit a limitation: the gear you can't use. Plenty is included, but far more is only available in the £220 deluxe version or as in-app purchases (IAPs).

This further frustrates when it comes to presets – the colourfully-named settings designed to recreate classic tones – as many need kit that's available as extra purchases.

Setting up AmpliTube 4 is easy – plug in your favourite guitar audio interface, open the app and choose a preset. We spent hours exploring the presets, hammering out power chords and playing blues licks. AmpliTube performed admirably, with no detectable lag.

Our only real complaint, kit limitations aside, is the interface. We can live with the visuals, but the lack of optimisation for Retina displays and the absence of a full-screen mode grate.

KENNY HEMPHILL

Alien: Isolation – The Collection

In space, everyone screams

› £39.99 › **FROM** Feral Interactive, feralinteractive.com
› **NEEDS** OS X 10.10.4 or higher


The motion tracker is a clever way to increase the tension.

MacFORMAT VERDICT

› Flawed but nerve-wracking, this is a great adaptation of the franchise.

★★★★☆

⊕ Hugely atmospheric
⊖ Limited strategies

Alien: Isolation is the game Alien fans have always wanted. It's absolutely horrible, but in the best possible way.

15 years after the end of Alien, Ripley's daughter Amanda travels to Sevastopol Station in search of closure, but predictably finds bloodthirsty star-beasts and rampant synthetics. The alien is vicious and merciless. It'll drag you into vents, rip the door off the cupboard in which you are cowering, or even stab you in the back while another character is going through some plot exposition. It can't be killed, so it must be avoided, though as the game helpfully pointed out while the alien dragged Ripley out from under a table, "Hiding is only ever a temporary solution".

Aside from some scripted moments, the alien is AI-driven, learns from your behaviour and appears at random, turning Ripley's motion tracker into a jump-scare generator thanks to terrific sound design and limited escape options. But if the movies taught us anything, it's that surviving an alien encounter should be unlikely, and the constant threat of disembowelment makes this is a horror worth battling to survive.

ALAN WILLIAMSON

Aurora HDR Pro

A powerful yet easy-to-use image processing tool

Reviewed by **NIK RAWLINSON**

› £215 (non-Pro edition without RAW support is £45 from the Mac App Store) › **FROM** Macphun, aurorahdr.com
› **REQUIRES** OS X 10.9.5 or higher



Comparisons let you see how your changes are altering the original shot.

We fired up Aurora HDR hoping for something stunning... we weren't disappointed

Mac FORMAT VERDICT

› Macphun's boast that this is "the world's most advanced HDR software" feels entirely justified.

★★★★☆

⊕ One-click HDR
⊕ Extensive tools
⊕ Easy to use
⊖ Non-Pro edition lacks RAW support

High Dynamic Range (HDR) images look great when they're done well, as they pull out detail from the shadows and recover pixels from the overexposed parts of a photo to provide a vivid, often other-worldly result. Done badly, though, they're awful, and then it's the poorly-handled technique itself that you notice far more than the actual underlying image.

We fired up Aurora HDR in the hope it would help us sidestep such heinous HDR horrors and produce something suitably stunning. We weren't disappointed.

Our starting point was one of its collection of more than 40 one-click adjustments that apply a tone-mapping preset to a single shot or several bracketed shots, the latter of which will help extract a greater level of detail. Adjustments are organised by type, so it's easy to switch between styles.

A lot of HDR apps stop there, but Aurora HDR lets you manually tweak the results, courtesy of slider controls that are as easy to use as Apple's Photos app. They address highlights, shadows and midtones, which are the bedrocks of HDR conversion, as well as a lot of tinting, vignette and filter controls too.



The built-in editing tools let you apply your own manual adjustments on top of the app's one-click presets.

You can save adjustments, so if you have a habit of shooting particular subjects a certain way, you'll be able to process whole folders more quickly (so long as you accept that not every shot is suitable for conversion).

Aurora's mask

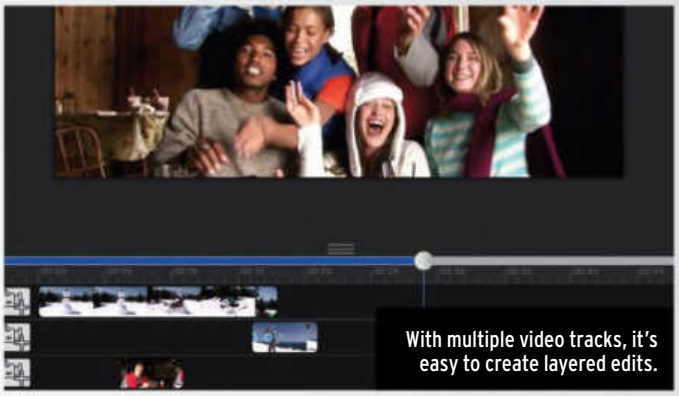
Adjustments are applied frame-wide at first, but can be constrained by applying a mask, a useful feature if you apply your adjustments onto separate layers. How? Imagine your original shot has a dark corner where some dense foliage has fallen into shadow: you might want to both lighten this and saturate it without touching the rest of the frame. In this instance, you would create a new layer, apply those two adjustments, and then use the eraser tool to brush them away from the areas where you want to retain the original look. Alternatively, you could use a gradient to affect, say, just the sky, foreground or, by rotating it, the contour of a hill.

Aurora comes in regular and Pro editions, the former of which is available from the Mac App Store, where its lack of support for RAW files has attracted criticism. The Pro edition, available from Macphun's online store, plugs this gap, as well as increasing the number of layers it can support, adding a chromatic aberration tool (for removing colour fringing), and working as a plug-in for Photoshop, Aperture and Lightroom. At £215 it's an awful lot more expensive than the lightweight Mac App Store edition, and although it's our preferred tool right now, you'll have to be serious about HDR to justify the outlay.

MovieSpirit

The perfect step up from iMovie?

› £4.99 › **FROM** Jacky Wu, ios.verytools.com/moviespirit
› **MADE FOR** iPhone, iPod touch, iPad


With multiple video tracks, it's easy to create layered edits.

Mac FORMAT VERDICT

› A feature-packed multi-track video editor, but not a finely finished one.

★★★☆☆

⊕ Many useful features
⊖ Too much missing

Multi-track editing is the paradigm used by most mid- to high-level video editing apps. It enables you to put videos on layers – yet those layers are able to contain video, photos, text, or even sound effects and soundtracks. Apple's iMovie has very limited support for layering elements, but MovieSpirit is totally on-board with it. We used up to 10, which is more than enough for 99% of projects.

When you add media, you'll immediately see a mini editing menu for actions such as trimming a clip's length, altering its volume, changing its speed, adding filters, cropping or resizing it, and much more.

These tools are easy enough, and there's a help button on each for anything that's unclear. There are plenty of transitions to use between scenes, and tools for creating keyframed motion.

It's the little things that are a letdown. When moving a clip, there's no preview of the frame you're moving it to. You can move the playhead first, but there's no snapping, and it's all quite imprecise. You can undo actions, but not redo them. iCloud-stored videos don't appear in the video picker (unlike in other apps). Also, the app can't do a live preview of projects with more than two tracks, even on the iPad Air 2.

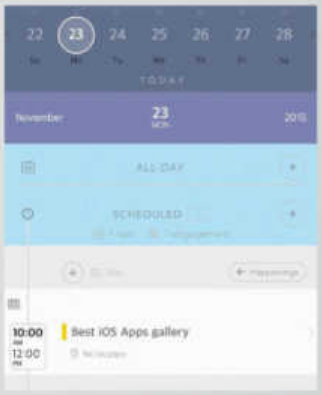
MATT BOLTON

SewUp

Organised, but doesn't knit well

› £4.49 › **FROM** SewUp, mobile.sewup.io
› **MADE FOR** iPhone, iPod touch, iPad


The vertical timeline makes it easy to spot potential clashes for event times.



Mac FORMAT VERDICT

› SewUp enables a tidy, conflict-free schedule, but lacks syncing skills.

★★★☆☆

⊕ Comprehensive app
⊖ Cluttered view

There are two types of people: those who love the challenge that comes from having a busy schedule, and those who don't. For those in the former camp, SewUp offers a comprehensive calendar that allows scheduling in five ways, from important meetings and all-day events to a general to-do list.

SewUp's interface feels a little overburdened at first, but starts to make sense as you use it. One of the features we like most is the vertical timeline used to establish start and end times – it's intuitive, easy to use and, best of all, displays already-scheduled events in the same period so you don't double-book. Should that happen, however, SewUp provides tools for dealing with conflicts.

Unfortunately, all this is done in isolation because the app is unable to import existing Calendar events or Reminders from iCloud, and it doesn't sync new items created in it to them. (It is able to tap into your contacts, though.) This is a significant limitation, especially since there's no iPad support or companion Mac app.

That's not to say the developer won't get around to adding these in the future, but for now the breezy utility is overshadowed by its seclusion from other apps.

J.R. BOOKWALTER

STORE GUIDE

EDITED BY **ALEX BLAKE**

Your complete guide to the best Apple hardware and third-party accessories

Welcome to MacFormat's new look Store Guide, the place to go to find out about all the Apple kit that matters. We've chosen our top products from Apple's product line-up, plus the best third-party kit that meets our quality standard.

Whether you're a recent convert or a seasoned Apple user, we highlight a model in each product category that's ideally suited to your needs. So, if you're looking for a new Mac, iPhone or iPad, just head to our handy tables to see exactly which model is best for you. We've also highlighted the gold standard in audio, storage, cameras, and many other categories so you can complement your Mac or iOS device with only the best accessories.

Who's it for?

ENTRY LEVEL
You're just getting started in the world of Apple and need to know where to begin.

UPGRADER
A firm Apple user, you're ready to move on and get even more from your tech.

HIGH END
Apple is your life. You prize quality and want the best that money can buy.

Inside your buying guide...

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iMac

Ever since the famous Bondi Blue iMac debuted way back in August 1998, Apple's all-in-one desktop computer has been setting standards in gorgeous design and powerful performance. Apple's spirit of innovation was as clear back then as it is today – the iMac was the first Macintosh to abandon the floppy disk in favour of USB ports, and its bright, colourful aesthetic set it apart as a playful pretender in a world of staid beige boxes.

These days Apple is again pushing boundaries with the iMac, blessing all of its 27-inch models with the world's best display, which has a massive 5K (5120x2880) resolution. Add in a quad-core Intel Core i5 processor (configurable from 3.2GHz up to 4.0GHz), 8GB of RAM, a fast and capacious Fusion Drive, and a powerful AMD Radeon R9 graphics processor – and the large iMac is *the* desktop system to own. In 2015, Apple lowered the price of the top-spec 27-inch model by £150 and introduced the first 21.5-inch iMac with a Retina 4K display. All iMacs (except the entry-level, 21.5-inch model) have a quad-core processor.

Choose an iMac

	MODEL	KEY SPECIFICATIONS	PRICE
ENTRY LEVEL	21.5-inch 2.8GHz quad-core Intel Core i5	**RAM** 8GB of 1867MHz LPDDR3 **GRAPHICS** Intel Iris Pro Graphics 6200 **STORAGE** 1TB (5,400rpm) **DISPLAY** 1920x1080 (IPS, sRGB gamut) **ALSO** Magic Mouse 2, Magic Keyboard	£1,049
UPGRADER	21.5-inch 3.1GHz dual-core Intel Core i5	**RAM** 8GB of 1867MHz LPDDR3 **GRAPHICS** Intel Iris Pro Graphics 6200 **STORAGE** 1TB (5,400rpm) **DISPLAY** Retina 4K (IPS, P3 gamut) **ALSO** Magic Mouse 2, Magic Keyboard	£1,199
HIGH END	27-inch 3.3GHz quad-core Intel Core i5	**RAM** 8GB of 1867MHz DDR3 **GRAPHICS** AMD Radeon R9 M395 **STORAGE** 2TB Fusion Drive **DISPLAY** Retina 5K (IPS, P3 gamut) **ALSO** Magic Mouse 2, Magic Keyboard	£1,849

UPDATED MAR 2015
EXPECTED Q2 2016



MacBook

The baby of Apple's laptop family, the MacBook is a marvel of compact design and ultra-portability. Weighing in at just 0.92kg, it's Apple's most lightweight laptop and easily stows away in a backpack for use on the move. The pixel density of its 12-inch Retina display stands at 226ppi, which is almost as high as the MacBook Pro.

The MacBook is powered by an Intel Core M processor (at 1.1GHz, 1.2GHz or 1.3GHz), which doesn't require a fan to keep cool, so the MacBook runs silently. It was also the first Apple notebook to feature a Force Touch trackpad, which can trigger different responses as you apply more pressure. All models come with 8GB of RAM and Intel HD Graphics 5300, while there are options for either 256GB or 512GB of flash storage. It's available in three colour options: Silver, Space Grey and Gold.

Choose a MacBook

	MODEL	KEY SPECIFICATIONS	PRICE
ENTRY LEVEL	12-inch 1.1GHz dual-core Intel Core M	**RAM** 8GB of 1600MHz LPDDR3 **GRAPHICS** Intel HD Graphics 5300 **SSD** 256GB	£1,049
UPGRADER	12-inch 1.2GHz dual-core Intel Core M	**RAM** 8GB of 1600MHz LPDDR3 **GRAPHICS** Intel HD Graphics 5300 **SSD** 512GB	£1,299
HIGH END	12-inch 1.3GHz dual-core Intel Core M	**RAM** 8GB of 1600MHz LPDDR3 **GRAPHICS** Intel HD Graphics 5300 **SSD** 256GB or 512GB	£1,249 or £1,419

UPDATED MAY 2015
EXPECTED Q2 2016



MacBook Pro

Following hot on the heels of the MacBook, the MacBook Pro recently gained a Force Touch trackpad. At the same time, the MacBook Pro range saw small boosts to its Intel and graphics processors. The top-of-the-line model is currently the only one to offer a discrete graphics processor, in the form of the AMD Radeon R9 M370X – the other models have an integrated Intel Iris or Iris Pro graphics processor.

All except the entry-level MacBook Pro are equipped with a Retina display, in either 13-inch or 15-inch sizes. They also have two Thunderbolt 2 and two USB 3.0 ports, an SDXC card reader, and their flash storage ranges from 128GB to 1TB, depending on the model you pick as a starting point. Battery life is also improved, with the 13-inch model lasting 10 hours and the 15-inch model going strong for nine hours.

Choose a MacBook Pro

	MODEL	KEY SPECIFICATIONS	PRICE
ENTRY LEVEL	13-inch 2.7GHz dual-core Intel Core i5	**RAM** 8GB of 1866MHz LPDDR3 **GRAPHICS** Intel Iris Graphics 6100 **SSD** 256GB	£1,199
UPGRADER	15-inch 2.2GHz quad-core Intel Core i7	**RAM** 16GB of 1600MHz DDR3L **GRAPHICS** Intel Iris Pro Graphics **SSD** 256GB	£1,599
HIGH END	15-inch 2.5GHz quad-core Intel Core i7	**RAM** 16GB of 1600MHz DDR3L **GRAPHICS** AMD Radeon R9 M370X **SSD** 512GB	£1,999

UPDATED DEC 2013
EXPECTED SOON



Mac Pro From £2,499

If you need power – and we mean *serious* power – this is the computer for you. Even the entry-level model comes with 12GB of RAM, a quad-core 3.7GHz processor, 256GB of speedy PCIe flash storage and dual AMD FIrePro D300 graphics cards. However, with a price point to match, it last being updated in 2013, and Thunderbolt 3 just around the corner, consider holding out for the next version.

UPDATED OCT 2014
EXPECTED LATE 2016



Mac mini From £399

A welcome update in 2014 brought a £100 price drop to the most affordable Mac. The mini has some interesting talking points: the entry-level model has a 1.4GHz dual-core Intel Core i5 processor and 4GB of RAM, making it akin to the entry-level MacBook Air but with a 500GB hard drive and no display. Higher end models come with 1TB storage (a Fusion Drive option is available), 8GB of RAM, a better graphics processor and either a 2.6GHz or 2.8GHz Intel Core i5 for £569 and £799, respectively. Those models can be upgraded to Core i7 processors, though there are no quad-core options available – you'll need an iMac for that.

UPDATED SEPT 2015
EXPECTED SEPT 2016



iPhone

Apple brought 3D Touch to the iPhone with the 6s and 6s Plus, providing extra interactions depending on the level of pressure you apply to the screen. For example, a light press on an email lets you 'peek' at its contents, so you can decide whether to delete it or, with a firmer press, 'pop' it open to reply to it.

The 12MP rear camera produces fantastic images, although you only get optical image stabilisation on the 6s Plus. But with support for 4K video recording, the 6s camera has been taken up a notch. All models have front-facing cameras for video calls. There's also Live Photos, which capture the moments before and after you take a photo to make a short video.

The largest capacity iPhone 6s comes with 128GB of storage, twice that of the iPhone 6. Avoid the 16GB model – that really isn't enough space.

Choose a iPhone

	MODEL	KEY SPECIFICATIONS	PRICE
ENTRY LEVEL	iPhone 6	**CAPACITY** 64GB **PROCESSOR** A8 **3D TOUCH** No **CAMERA** 8MP photos, 1080p video recording	£539 R
UPGRADER	iPhone 6s	**CAPACITY** 64GB **PROCESSOR** A9 **3D TOUCH** Yes **CAMERA** 12MP photos, 4K video recording	£619 R
HIGH END	iPhone 6s Plus	**CAPACITY:** 128GB **PROCESSOR:** A9 **3D TOUCH** Yes **CAMERA** 12MP photos, 4K video recording	£789 R

UPDATED SEPT 2015
EXPECTED Q2 2016



iPad

Aside from the beautifully gargantuan iPad Pro, there was a small but very welcome change among Apple's other tablets. The iPad mini 4 was unveiled alongside the Pro back in September 2015, and it's essentially an iPad Air 2 in a smaller chassis. The iPad Air 2 hasn't changed since late 2014, though.

On the software side, iOS 9 has brought multitasking features, which are a boon for productivity. You can slide a second app over the right side of the one you're working in (great for quickly checking email), then dismiss it to get back to work. Picture in Picture enables you to watch video in a corner of the screen – but it may be a bit too small on the mini. Those two features work on the Air, mini 2 and Pro and newer models. There's also Split View, on the Air 2, mini 4 and Pro, which lets you work on two apps side by side.

Choose a iPad

	MODEL	KEY SPECIFICATIONS	PRICE
ENTRY LEVEL	iPad mini 2	**CAPACITY** 32GB **PROCESSOR** A7 **CONNECTIVITY** Wi-Fi **CAMERA** 5MP **TOUCHID** No	£259 R
UPGRADER	iPad Air	**CAPACITY** 32GB **PROCESSOR** A7 **CONNECTIVITY** Wi-Fi **CAMERA** 5MP **TOUCHID** No	£359 R
HIGH END	iPad Air 2	**CAPACITY** 128GB **PROCESSOR** A8X **CONNECTIVITY** Wi-Fi **CAMERA** 8MP **TOUCHID** Yes	£559 R

UPDATED NOV 2015
EXPECTED 2016?



iPad Pro From £679

The largest iPad packs in a 12.9-inch display, and comes in 32GB and 128GB capacities. Every model has Wi-Fi, and the most costly one also works with mobile networks. Its A9X processor is the most powerful in any iOS device, and it has an impressive four-speaker sound system, too. Add the pressure-sensitive Apple Pencil and it becomes an accomplished drawing tool that's surprisingly lightweight for its size.

UPDATED SEPT 2015
EXPECTED MID 2016?



Watch From £299

Apple's first foray into the world of high fashion certainly turned heads when it arrived on the scene. Apple has since released a slew of updates in the form of watchOS 2, which expands the capabilities of third-party apps, as well as a range of new case colours and strap options (although hardware specifications are unchanged).

Among the new straps are several Hermès models, available as Single Tour, Double Tour or Cuff bands, and Product(RED) and two different white versions of the Sport Band. The Watch comes in aluminium, stainless steel or 18-carat gold cases, the first of which now has Gold and Rose Gold colours.

BEST BUYS... curated picks of third-party kit

MONITOR

ViewSonic VP2772 £569

viewsonic.com



If you're not fussed about 4K but still want exceptional image quality, this IPS display is truly superb. It offers 99% coverage of the Adobe RGB colour space, 10-bit colour and a 2560x1440-pixel resolution. It has HDMI 1.4, DVI and Mini DisplayPort connections, and four USB 3.0 ports for expansion.

ULTRA HD MONITOR

AOC U3277PQU £574

aoc.com



The recent winner of our 4K displays group test, this 32-inch screen is a joy to work with, and a monitor of this size is the perfect setting for 4K to really come into its own. From stunning picture quality and top-notch contrast ratio to the reasonable price for such a wide display, it's a winner all round.

PORTABLE STORAGE

Samsung T1 SSD From £88

samsung.com



Light, speedy and astonishingly small, the Samsung T1 is the definition of portable SSD storage. As well as having an attractive design, it is among the best-performing drives of its kind that we've tested, features AES-256 hardware-based encryption, and is more affordable now than when we reviewed it.

NETWORK STORAGE

Western Digital My Cloud Mirror £255

wdc.com



Winner of *MF294*'s NAS group test, the My Cloud Mirror provides Apple-like ease of use – but it's no Time Capsule knock-off; with top performance (thrashing its group test rivals when it came to writing large files), whisper-quiet operation and a good range of features, it's great if you want more from a NAS.

WIRELESS ROUTER

Netgear Nighthawk X4S £252

netgear.co.uk



This aggressively-named router may be expensive, but it's one of the best that money can buy. Sporting four aerials, the Nighthawk boasts four separate signals for a total speed of 2.5 gigabits per second. And with dual-band 802.11ac Wi-Fi, AirPrint support and an excellent app, it's one powerful router.

THUNDERBOLT DOCK

Elgato Thunderbolt 2 Dock £180

elgato.com



The most affordable Thunderbolt 2 dock in *MF285*'s group test was also the best. Unlike some docks, it provides a useful drive ejection utility. With three USB 3.0 ports and a passthrough Thunderbolt 2 port (which supports a 4K display), its combo of impressive features and a good price is a mighty strong draw.

PRINTER

Samsung Xpress SL-M2026 £50

samsung.co.uk



For simple home printing at an affordable price, you just can't beat this mono laser printer. For £50, you get 20 pages per minute printed at great quality, plus a rack of eco-friendly options, beating its main rivals at this price point. It doesn't print colour, but if that's not an issue for your documents then this is a no-brainer.

MACBOOK STAND/DOCK

Henge Docks Horizontal €449 (about £325)

hengedocks.com



This is a seriously powerful dock. With more ports than you can shake an Apple Pencil at (13, to be precise), thermal vents to keep your MacBook cool, plus an elegantly simple design, it's useful as well as beautiful. You can add up to three displays, two audio devices, six USB 3.0 devices and much, much more.

MACBOOK BAG

Knomo James £169

knomobags.com



A beautifully made bag with a surprising amount of space inside. You'll love the little touches, such as its big chunky zips and flashes of colour. It's easy to turn the Knomo James into a smart office bag by removing the backpack straps, and Knomo provides each bag with a tracking ID in case yours goes AWOL.

BEST BUYS... curated picks of third-party kit

WIRELESS SPEAKER

Bowers & Wilkins Zeppelin Wireless £499

bowers-wilkins.co.uk



This airship-inspired speaker is certainly striking, but it's more than just a looker, with crisp, clear treble and refined bass output over previous Zeppelin models. Support for Bluetooth, Spotify Connect and AirPlay makes for plenty of connectivity, and dynamic EQ ensures controlled bass at all volumes.

DESKTOP SPEAKER

Roth OLi POWA-5 £200

rothaudio.co.uk



Just one listen to these desktop speakers will tell you they're in a class of their own. Their firm bass and detailed, rich sound packs a punch thanks to 80W output, and they feature Bluetooth streaming and a wide range of analogue and digital inputs. Hi-fi quality audio for £200? Sounds great to us!

PORTABLE BLUETOOTH SPEAKER

Kef Muo £299

kef.com



Hi-fi king Kef brings its audio know-how to the portable speaker world and blows away the competition. Firm bass, a rich, detailed sound and sturdy build combine to form one impressive package, while you won't be let down by the solid battery life. It's one of the best portable speakers you can buy.

ON-EAR HEADPHONES

Plantronics Backbeat Pro £125

plantronics.com



Wireless headphones are often blighted by meagre battery life, but not so with these cans, which run for more than 25 hours. They offer active noise-cancelling, brilliant wireless range, superb comfort and a huge range of intuitive touch controls, making these the wireless headphones to beat.

IN-EAR HEADPHONES

RHA MA 750i £90

rha-audio.com



These in-ear buds impress on nearly every level. They come with easy-to-use inline controls and a steel-reinforced cable, while faultless low and mid range reproduction and a crafted, premium feel make them earphones of distinction. They are a world away from Apple's cheap earbuds.

PORTABLE BATTERY PACK

Mipow Power Cube 9000 £48

mipow.co.uk



This diminutive charging pack for iPhone is so named because it comes with a 9000mAh battery that'll charge your phone up to three times. It's a beautifully compact device that'll fit right in with your other Apple tech, and comes with a pop-out Lightning cable, a handy on/off switch and USB/Micro-USB ports.

IP CAMERA

Netgear Arlo From £180

netgear.co.uk



This home security system's cameras are totally wireless, enabling you to mount them where you want; night vision, weatherproofing and a 130° field of vision makes them ideal outdoor eyes. Video quality is excellent, the cameras look smart, and your footage is stored in Netgear's free cloud storage.

iPHONE STAND

Just Mobile AluBolt £41

just-mobile.com



Charge your iPhone in style with this simple yet elegant stand. From the curved backstop to the rounded aluminium base, it oozes Apple-esque design chops and will fit right in among your other Apple kit. The Lightning connector can be tilted to help mount your iPhone on it, which is a nice touch.

APPLE WATCH STAND

Nomad Stand for Apple Watch £50

hellonomad.com



Nomad's stand is an absolutely gorgeous Apple Watch charging dock – carved from a single piece of curved aluminium, it looks like it could have been designed by Apple. Its weighty base keeps everything in place and the cable management is so tidy that it looks like there's no cable there at all.

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NEXT ISSUE Customise your Mac



ULTIMATE OS X TWEAKS

Get the Mac you always wanted with our guide to the best ways to customise OS X.

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- The best free apps for iOS devices
- Put an old iPod touch to good use!

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Contact us

Email your queries and your questions to **letters@macformat.com**

LETTER OF THE MONTH!



iCLOUD NIGHTMARE

I have encountered a problem with iCloud's two-step verification feature. Devices affected are my iPad Air 2 running iOS 9.2 Beta 4 and my iPhone 6s running iOS 9.1.

I recently tried to sign in to iCloud.com from my iPad Air 2. I used Safari's Request Desktop Site feature to access the full version of the site. When I arrived at a page that asked me to sign in, I did so, and then I was asked to verify my identity. Tapping Verify allowed me to pick which device to send a verification code to. Tapping Next sent the code to my other device and the iPad advanced to a screen where I was supposed to enter the code. This is where the problem arose. I could not enter the code as the screen appeared to freeze, although I was allowed to ask for another verification code. I switched off two-step verification and I was able to access my iCloud account without any problems on all my devices.

by FRANK LAWSON

ALAN SAYS... We followed your steps and encountered the same problem. It isn't that the whole screen becomes unresponsive; you can tap other parts of the page. After repeatedly backing up a step and requesting a new code, we were eventually warned about having made too many requests. However, on this final attempt the on-screen keyboard popped up and we were able to enter the verification code. It seems Apple hasn't anticipated people trying to access iCloud.com in this way for this purpose. We suggest reporting it apple.com/feedback/icloud.htm.

KEY TO THE QUEST

I was intrigued to see your tip, in issue 295, about running Windows in Boot Camp and using various key combinations on the Magic Keyboard to perform Windows actions. I play the veteran MMORPG, EverQuest, on Windows 10 in a Boot Camp partition and I have found that there is no substitute for a Windows keyboard, especially when I need to use the function keys.

These are important in EverQuest, for example, to target a selected player, to alter the mouse action, or to clear the screen of chat windows so as to actually see where you are going!

by SUSAN PLATTER

PAUL SAYS... There's an easy fix for this, but it depends on you having installed Apple's Boot Camp Support Software in Windows. That's a collection of drivers for your Mac's hardware, which Boot Camp Assistant offers to download. To do so, it requires a USB flash drive whose contents you don't need. If you didn't do this when you installed Windows, open the assistant and ensure *only* the option to get the drivers is checked before proceeding.

Restart in Windows and install the drivers. Once that's done, you'll find a diamond-shaped icon in the System Tray. Click it and choose Boot Camp Control Panel. In the panel's Keyboard tab, turn on 'Use all F1, F2, etc keys as standard function keys'. Now you won't need to hold fn when pressing those keys to invoke actions that are assigned to them in EverQuest.

ALL AT USB-C

Back in the summer, I bought the new 2015 12-inch MacBook with the thought of using it to replace my battered old HP ProBook. It's doing the job amazingly. There is just one drawback that's (almost) making me regret the decision. With the ProBook I had a brilliant dock on my desk that I just sat my laptop in, and which instantly made my home office a whole lot more bearable with the sort of setup you would expect from a desktop. Unfortunately, due to the MacBook's single USB-C port I'm struggling to find something that lives up to my expectations. I'm looking for something that will allow me to use an external display (or two) along with my USB DVD writer, and add a few other USB ports, all whilst charging the battery in my MacBook. Do you know of any good ones?



Apple sells adaptors for connecting several things to a USB-C port. You may need to add other cables.

by MIKE WITTS

CHRISTIAN SAYS... Try Apple's £65 USB-C Digital AV Multiport Adapter (or the VGA version), which has three ports: an HDMI one that, with a suitable cable, can connect an HDMI or a DVI monitor; a standard USB port, to which you can attach a powered USB hub; and a USB-C port for your MacBook's power adaptor.

PHOTO STREAM

GET INVOLVED!

› The iPhone is the world's most popular camera, but it takes a bit of work to get a truly excellent shot. Why not show us your creations? Simply email us at **photos@macformat.com** and your work could be showcased on these pages!





Walking the Line

by NIC DAVIES

EQUIPMENT iPhone 5

› I travelled up to The Peak District from London for what has become an annual cycling weekend with a couple of friends. Time and schedule meant my DSLR had to stay in London. The limitations of my iPhone 5's camera, wouldn't do justice to the scenery, so I resigned myself to enjoying the beauty of the landscape without the pressure of recording it. As we prepared the bikes, I saw this couple returning from walking their dog. They were framed beautifully by the trees, the fog softening the background so they stood out as near silhouettes. Simple!

WHY IT WORKS...

RULE OF THIRDS

› The path and strong diagonals in this image were like a tunnel. The rule of thirds works perfectly here.

SEPIA TONE

› The original image was flat and lifeless. It needed work in Enlight to spruce it up, before adding a filter in Instagram.

RADIAL BLUR

› Working in Enlight, the figures in the 'tunnel' are framed well using a touch of blur to the photo's edges.

MY PHOTO APPS ›

TINTYPE 79P

› I use this app for portraits and low light subjects, ironically making modern images look as if they were created using 100 year-old techniques. Used sparingly, it produces some unique images.

ENLIGHT £2.99

› This is good for all image processing requirements, can even mix multiple images, and has very sophisticated levels of control. Intuitive and easy to use, it can also export to Instagram.

LO-MOB £1.99

› Lo-Mob processes images using a range of retro effects. My favourite setting is Tri-Black film, which gives a very dramatic treatment to simple graphic subjects. I use this combination a lot in my work.

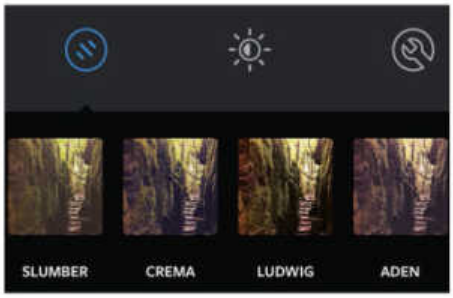
Get the look...

Learn how to get fantastic iPhone shots like the pros ›



1 Crop to thirds

Nic's winter walk shot works because of the 'rule of thirds', framing the walkers in one corner. Here we have a path through some woods but it was central in the image. A quick crop in Photos sorts it out.



2 Apply vintage filter

A quick export to Instagram provides you with more vintage filter options. Nic's recommendation was its Crema filter. Tap to apply a filter, and then save the image back to your iPhone's Camera Roll.



3 Blur the edges

The excellent Enlight app is one of the best ways to add a tilt-shift effect to a photo. Move your fingers outwards to apply a radial blur, softening the edges of the photo for a stronger focal point.

Photo album

Great shots that make it into our gallery ›



Blackfriar pub, London
› Eric McAlpine took this with his iPhone 6 using Camera+ and tweaked in Photoshop Express.



Staunton State Park, Colorado
› Angel Rosas used an iPhone 6s to capture this lovely toned shot with the Instagram app.



Christmas Markets, Manchester
› Taken on an iPhone 6 Plus, this image by Adrian McGarry caused quite a stir in the Manchester social media streams. Near to Christmas it was trending on Twitter with thousands of likes and shares. How festive!

goodbye...

TIME MACHINE

Classic Apple kit reinvented for the modern age



We don't see much in the way of wood from Apple, but we bet the designers thought about gold keys!

The Golden Apple

A walnut Macintosh... what's not to like?

The Golden Apple is a luxurious one-of-a-kind Macintosh 128K replica from Swedish craftsman Love Hultén. It's handmade from American walnut to the exact dimensions of the 1984 original, right down to the built-in carry handle. It's no relic hardware-wise though, it's got a Mac mini mounted inside, and the floppy drive has been replaced with a DVD drive. The custom-made mechanical keyboard uses Cherry MX Blue tactile switches, which are covered by gold-plated key caps made from zinc. A wireless mouse made from walnut completes the setup.

› Price on request › **WEBSITE** lovehulten.com › **DIMENSIONS** 34.5x24.4x27.7cm
› **INCLUDES** Wired keyboard, wireless one-button mouse

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